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AMERICAN ANTIQUITY

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PRE-COLUMBIAN ART AND ART HISTORY

PÁL KELEMEN

THE acceptance of pre-Columbian art as true and great art did not come speedily. In fact, it has not yet been as generally accepted as has the art of the great civilizations of the Near East and the Far East. An attempt is made here to trace the slow progress toward its general acknowledgment and to examine some of the problems now confronting those concerned with the subject.

When, in the second half of the eighteenth century, humanistic studies gained a wider interest, there already existed a predilection for the art of Greece and Rome and what was built, developed, and permuted on these styles. Neither the Near East nor the Far East was then sufficiently known to be given serious esthetic consideration, and their artistic products were appreciated mainly as rarities and curios; the arts that throve or lay in ruins elsewhere over the globe were glimpsed only occasionally in the travel descriptions of intrepid voyagers.

This was the situation when J. J. Winckelmann (1717–1768) set forth the principles of Greek art, as he saw them, in his book, *Thoughts on the Imitation of Greek Works in Painting and Sculpture*, which became a sort of *vade mecum* to most artists and architects of his day. Living and traveling in Italy for years, as he did, Winckelmann must have come in contact with the works of the great painters of the thirteenth and fourteenth centuries (Duccio, Giotto, etc.); examples of Etruscan art were abundant at that time and, along the highways of travel, there were still buildings in a style that borrowed greatly from the Orient. But he ignored sources other than the classic; there is little evidence that the age took cognizance of any art that did not conform to the canons of Greco-Roman esthetics.[1]

Neoclassicism swept Europe; the new social class, the bourgeoisie, feeling its way cautiously along the wall in economic and spiritual matters, preferred the classic pattern. The *Annales du Musée de l'Ecole Moderne des Beaux-Arts*, first published in Paris in 1800, bears witness to the taste of that period. In the frontispiece of Volume I a young woman is pictured, dressed *á l'Empire*, seated in a Greek chair and reading by the light of a Greek lamp. The busts of Phidias, Minerva, and Apollo look down on her from the wall and, below them, in three garlanded medallions, are the portraits of Bramante, Raphael, and Michelangelo.

The picture epitomizes the limitations of interest in art of that day. In the series of volumes that were issued year by year the earliest painters discussed were Leonardo da Vinci and Raphael; the great Venetian masters were sparingly represented, but an overwhelming number of Rubens appear, along with French classicists of the eighteenth century, today forgotten. No mention is made in all these tomes of the painters of the Trecento and Quattrocento; they were considered "primitive" and were ignored.

Herewith begins the misuse of that overworked word, "primitive." It has been applied to many different art styles, simply, it would seem, because they did not accord with Greco-Roman or Renaissance esthetic standards even though they showed a maturity in artistic inventiveness and a transcendental power equal to those found in the manifestations of later Western civilization.

As travel became easier in the mid-nineteenth century and the steamboat began to penetrate distant harbors, the products of unfamiliar cultures began to attract attention, and a new accommodating adjective, "exotic," was added to the vocabulary of the art historian. This also came to cover a wide variety of art—the scarabs of ancient Egypt, Persian miniatures, and fine examples of the Chinese,

[1] Influential to the neoclassic trend were also: the discovery of Pompeii [1748], Soufflot's visit to Paestum [1750], and that of Stuart and Revett to Athens [1751].

Hindu, or Japanese as well as the ware of the bazaars, all were herded under the label "exotic." The term became still broader as Gauguin and his confrères opened Polynesia and Melanesia to the art connoisseur. Finally, African sculpture was added when a British punitive expedition brought back from that continent Benin bronzes and ivories which started a new mode. The enthusiasm was quickened in Europe by the sale of duplicates at auction in 1899–1900.

While the adjectives "primitive" and "exotic" often have for us intriguing connotations, considerable confusion exists in their application, and both terms need redefining in the light of modern scholarship.

But whether or not the arts of these extra-European countries come under the heading of "primitive" or "exotic," they have by now been appraised, popularized, and finally accepted. Only pre-Columbian art is still seen by many through the fog of certain misapprehensions. A number of factors have tended to retard the appreciation of it, both in popular and scholarly circles.

The first of these is the traditional orientation of our own art history, as just outlined. Pre-Columbian art developed and flowered in isolation—in isolation at least from those contacts with the eastern hemisphere which formed the background of the white man's culture and contributed toward the formulation of our esthetic principles. Furthermore, it was destroyed almost upon discovery and only the most tenuous of living threads remain to guide us across the centuries.

Another factor, especially important in retarding the spread of an appreciation of pre-Columbian art to a wider public, has been the manner of its presentation. Until recently, museums clung to a formal tradition of display established in the nineteenth century, when taste was more conservative and the very purpose of the museum somewhat different. When, in 1923, the Maudslay collection of Maya material was brought out of the basement of the Victoria and Albert Museum and given a separate room in the British Museum, the objects had to be accommodated in tall, narrow wall cases, painted dark brown outside and a pike gray inside. The superb bust of the Maya Maize God was set on the top of one such case, with stone fragments from Copan, larger and less intelligible, on either side. Smaller carvings were lined up, row on row, on bare painted shelves, with little regard for color and size. No better was the display at the Trocadero Museum in Paris (rebuilt in 1937 as the Musée de l'Homme). Here a confusion of objects and casts, increased by a lack of labels, hindered any profound enjoyment. And the situation in other continental collections was not much nearer the ideal.

In this particular, however, great changes are in progress. The museums have started to rearrange their material with an eye to attracting and informing a wider public. Pre-Columbian jade and gold are now being displayed on materials that enhance their color and reveal their workmanship. We now see pottery and sculpture being displayed on varying levels and against backgrounds that set off their shape and color tones. With striking photographs and a few clear models, an atmosphere is being created which is both effective and instructive—a far cry from those somnolent museum halls of yesteryear. However, as museum-goers have in them something of the "window-shopper," the museums might still apply, with judicious adaptation, the lighting and display technique in the development of which the commercial field has made such strides.

Another reason for the slow awakening of interest in pre-Columbian art can be found in the art market, with its constant fluctuation influenced by supply and demand. With a variety of items—from Chinese jade and Egyptian statuary to Expressionist and Surrealist painting—the market abounds. In contrast, the whole corpus of pre-Columbiana is incomparably small. Furthermore, most of the masterpieces, as well as specimens of good quality, are owned by museums or connoisseurs who hold onto them; only occasionally is a fine piece put up for sale. To this circumstance is added the embargo that nearly all Latin American countries have declared on material excavated or found within their borders. Thus, one of the great factors in stimulating public taste and connoisseurship—commercial publicity—is largely nonexistent in our field.

Because of this lack of actual material at hand, the presentation of pre-Columbian art in publications takes on special importance. Previous generations had to depend largely on sketches, and these have always been deceptive. When a number of drawings of the same Classical sculpture, made through the

centuries, show great divergences, what can be expected in a field totally alien to the artist?[2] Trained as he is in our ideals of beauty and technical mannerisms, he unconsciously approaches a pre-Columbian subject with a bias. Today, however, we have at our disposal the highly developed technique of modern photography.

By means of photography, a certain human interference with the accuracy of form and outline is avoided, but pitfalls still remain. Many pieces were designed for a particular setting. It is well, in presenting them, to consider what the original lighting may have been and what the surrounding colors. As the art of any period mirrors its intellectual as well as its artistic consciousness, every effort should be made to register the spirit behind it. In pre-Columbian art, special care is necessary, for a large part of this civilization has been shattered, and only the torso, as it were, remains.

While a photograph in total profile or directly *en face* may give a satisfactory idea of a statue from our own civilization, a sculpture from another esthetic world often requires another angle. This will become evident to anyone who compares the early photograph of the Maya Maize God in the British Museum,[3] a straight *en face* view, with the newer one, which is now widely circulated. In the former, because of maladroit lighting, the eyes, so subtly carved, appear half blind, and the outstretched arms are like lifeless stumps because the foreshortening was not taken into account; the somewhat damaged mouth seems protruding without expression, whereas in the actual figure the half-open lips convey a strong sense of communication. By turning the statue to a three-quarter profile, as in the second photograph, lighting it indirectly and from above, and placing the camera rather low, at least some of the spiritual quality with which the unknown Maya sculptor imbued his work is revealed.

In many pre-Columbian pieces the point of emphasis is very different from our own and requires careful consideration before the camera is employed. For example, there are single carvings to which three-dimensional sculpture, low relief, and incision are all applied—a rarity in the arts of other civilizations.

With pottery also, pictures completely adequate for archaeological study do not necessarily evoke artistic impressions. On the other hand, a monotone vessel placed against a textile background of lively pattern and illuminated in a strong chiaroscuro that engulfs half the object in total darkness may make an "artistic" photograph, but it will not go far in revealing the art inherent in the piece itself. Although natural light gives the best illumination, local conditions often make artificial lighting necessary. Under floodlights, however, both the plastic effect and the quality of the object suffer.

In all this work, the one for whose eyes it is intended, unfamiliar as he is with the atmosphere of the pre-Columbian world and untrained in translating the strange object from the flat black-and-white of the reproduction into the three-dimensional of actuality, must be kept in mind.

In regard to pictures that are to be published as illustrations, a number of considerations arise. Of the various methods at hand, gravure is likely to prove the most expensive on small runs. While the reproductions are contrasty and dramatic in effect, they are not so fine in detail in the middle tones. One advantage lies in the fact that the illustrations can be printed on the same paper as the text. Offset printing, requiring neither a large initial investment for metal plates nor a coated paper, is perhaps the least expensive. The pictures, however, are inclined to be somewhat monotonic.

The gelatine process, or collotype, has proved satisfactory in much art reproduction. It is especially successful in reproducing canvas paintings, where a greater differentiation of tone, so favorable to the Venetian masters or the Impressionists is achieved. Since the reproduction is not effected by means of a series of dots, the lines of a drawing are presented unbroken. A photograph of a half-tone usually reproduces better in collotype because the "screen" does not show up so clearly. But small-size illustrations often blur. The method also leaves much to be desired in the presentation of three-dimensional objects. It is not satisfactory for large editions, as the plate deteriorates with usage and cannot be sharpened up.

For the pre-Columbian field, the half-tone

[2] William M. Ivins, Jr., "Ignorance, the End," Metropolitan Museum of Art, Bulletin, No. 1, Summer, 1943, pp. 3–10.

[3] British Museum, *Guide to the Maudslay Collection*, London, 1923, p. 71.

has much to recommend it; because of the strangeness of the subject, the contrasty character of the cuts serves well to support the imagination. At the same time, the sharper contours, showing clearer details, are advantageous in the reproduction of such difficult subjects as a Oaxaca jade or a Quimbaya gold figure. Copper plates, because of their durability, are always advisable when a sizable edition or the possibility of reprinting is to be considered.

After the most satisfactory method of reproduction has been found, the arrangement of the illustrations on each page can still contribute much to the final effect. Aside from their grouping as to subject, they should be viewed from the standpoint of quality, color, and character. Attention should be given to the proportions—first, in reducing or enlarging the individual photograph, and, second, in establishing harmony between the pictures that are to make up one plate. While a uniform size may appear inviting if the number of illustrations is comparatively small, when the number is large, variation in size of the various cuts and even in their arrangement will prove refreshing to the reader. Much can be pointed up by judicious cropping and by the airbrushing of some backgrounds.

Color plates, while strikingly effective to the eye and valuable in the study of designs in which color is the primary factor, cannot be accepted as accurate in their representation of color. The process can separate only a set number of shades, chemically produced; the color-scheme of nature—which has more than three greens or four browns—can only be approximated. Many art objects have lost color intensity and acquired patina. In the case of a Paracas textile, for example, we are confronted with a mellowness of vegetable and mineral dyes, the result of the aging of some thousand years. To seek the exact tones in analine or other synthetic colors is as futile as to try to make in a laboratory the equivalent of a Tokay wine, say, from 1875.

We come now to the matter of the slow acceptance of pre-Columbian art into the chapters of art history. Until a quarter of a century or so ago, even in Europe research in art history was not pursued by many, and the interest of those who did pursue it was likely to be directed toward the great periods of art in or near their homeland. Only comparatively recently do we meet with a growing number of art historians and esthetes reaching beyond the borders of the more familiar cultures for subjects that are geographically and ideologically more distant; Yukio Yashiro's book on Botticelli, published in 1924, was perhaps the first in which an oriental author treated a subject of occidental art for Occidentals. The very few art historians in this country just after the last war generally followed the lines of our European heritage and its themes.

Fortunately, however, there were scholars both here and abroad who quite early were struck by the high quality of pre-Columbian art and championed its cause. The great American archaeologist, W. H. Holmes, started in the 1880's to publish articles in which various objects of different pre-Columbian cultures were treated as art. In 1914 Holmes came as art editor to the new magazine, *Art and Archaeology*, and wrote the leading article in its first number, titled "Masterpieces of Aboriginal Art." Therewith began a series of clearly written discussions, running until 1919, emphasizing the esthetic in such diverse subjects as stucco work, mosaic, sculpture, goldsmith work, etc. Besides being a foremost anthropologist, Holmes remained throughout his life—as revealed in his painting—an artist in his innermost soul.[4]

The same magazine, until its regrettable discontinuation in 1934, published many articles in which various themes of pre-Columbian archaeology were considered from the standpoint of art. The authors included Zelia Nuttal, Edgar L. Hewett, Kenneth M. Chapman, Frans Blom, A. V. Kidder, Earl H. and Ann Axtell Morris, and Jean Charlot—to mention only the best known. While making their great contributions to archaeology, Alfred P. Maudslay, a contemporary of Holmes, and Marshall H. Saville and Herbert J. Spinden, who followed, offered much in their esthetic approach to satisfy and lead the art historian forward.

In Europe, among the very first to recognize the contribution of pre-Columbian art to art history was Roger Fry, who wrote in 1918, after discussing pre-Columbian objects: "We have begun to look at them seriously as works of art."[5] It is relevant to quote from the same essay:

[4] Walter Hough, "William Henry Holmes," *American Anthropologist*, Vol. 35, No. 4, pp. 752–764.

[5] Roger Fry, "Ancient American Art," *Burlington Magazine*, November, 1918, pp. 155–157.

"At times, Maya sculpture has a certain similarity to Indian religious sculptural reliefs, particularly in the use of flat surfaces entirely incrusted with ornaments in low relief, but on the whole the composition is all in favor of the higher esthetic sensibility of the Maya artist whose coordination of even the most complicated forms compares favorably with the incoherent luxuriance of most Indian work." What individuality and perspicacity were necessary to come out with such a courageous statement in 1918! "Maya art comes much nearer to early Chinese sculpture; again one wonders that such a civilization should have produced such sensitive and reasoned designs —implying a highly developed self-conscious esthetic sensibility—nor do the Maya, for all their hieratic ritualism, seem to fall into the dead mechanical repetition which the endless multiplication of religious symbols usually entails, as for instance, most markedly in Egyptian art." After more than a quarter of a century nothing more pertinent could be said today.

Roger Fry's first contribution on pre-Columbian art appeared in 1910. He went into the field with growing enthusiasm and included ancient American art in his lectures. Before his untimely death in 1934, he had scrutinized in the light of his rare talent many facets of pre-Columbian art and evaluated them in his brilliant manner. His posthumous volume[6] is an inspiration to anyone familiar with the difficulties he had to face in the esthetic prejudices of his time.

In continental Europe, also, interest was rising. In 1921 the eminent Americanist Walter Lehmann published his *Mexikanische Kunst*—a good number of plates with a useful and expert introductory essay; this appeared in the series *Orbis Pictus*, in company with volumes on Hindu architecture, Russian art, and Chinese landscape painting. Herbert Kühn included pre-Columbian art in his *Die Kunst der Primitiven*, 1923. The Propyläen Kunst-Geschichte found the subject important enough to give it considerable space in Eckart von Sydow's tome, *Die Kunst der Natur-Völker und der Vorzeit*, 1923. Six years later, the same series brought out *Kunst and Kultur von Peru* by Max Schmidt, which, on account of its informative text and lavish illustrations, is indispensable even today. Published in the same decade, the extensive survey *Geschichte des Kunstgewerbes*, Volume II, contains much material from the field accompanied by enlightening text by Friederich Röck. The great Austrian art historian, Joseph von Stryzgowski, after a lecture tour here, emphasized in his writings the importance of the art of pre-Columbian America and urged American art historians to enter this virgin field, as they were in the advantageous position of being near the locale. His essays, *The History of Art and the Two Americas*, 1924, and *North and South in the History of American Art*, 1928, are written with great unconventionality of viewpoint and delightful penetration. Contemporaneously, Eugene de Cholnoky, following an exhaustive study trip here, pointed out the cultural apartness of many inventions in the arts of pre-Columbian America.

Eli Faure, in the second volume of his *Histoire de l'Art*, 1909–1921, devoted a long chapter to the art of the tropics, in which pre-Columbian art is discussed at length, though perhaps in places with somewhat heavy literary overtones. A. Basler and E. Brummer's *L'Art Precolumbien* was published in 1928, and a year later, in the series *Les Cahiers de la Republique des Lettres des Sciences et des Arts*, a collection of essays appeared on the same subject by a number of scholars.

The Studio, London, renowned art-publishing house, persuaded T. A. Joyce to write *Maya and Mexican Art*, 1927, in which he devoted a chapter to each category of the various arts. In Cossio-Pijoán's encyclopedic *Summa Artis* (Madrid, 1931), much space and many good illustrations are devoted to the presentation of pre-Columbian art.

The distinguished Swedish expert on Italian painting, Osvald Sirén, later turned sinologist, wrote and lectured with the zeal of the convert, pursuing similarities between ancient Chinese bronzes and some pre-Columbian objects. Carl Hentze[7] also attempted to draw analogies between certain Asiatic cultures and the ancient American, on the basis of iconography and folklore. The conclusions of these last two authors, developed from appearances, are highly controversial, but one point is evident: they, together with the many authorities named, recognized the unusually high artistic

[6] Roger Fry, *Last Lectures*, Cambridge University Press, 1939, pp. 85–96.

[7] Carl Hentze, *Objets Rituels, Croyances et Dieux de la Chine Antique et de l'Amérique*, Anvers, 1936.

qualities in pre-Columbian civilization and gave it publicity through their attention and study.

While archaeologists in this country were pioneering the whole field and then investigating and laying open in a thorough and scholarly manner individual, highly artistic cultures, art historians here remained, on the whole, unmoved. Until recently, the subject of pre-Columbian art was ignored by the editorial board of their official publication. With our entry into the war and our intensified Good Neighbor policy, more attention was given to Latin America and finally, in June, 1942, there appeared in their official organ a bibliography[8] of the archaeological and related Americanistic articles that had been published in periodicals since 1940.

Although this belated admittance of the subject was mainly a compilation and not a creative work, a tendency to speak *ex cathedra* was noticeable. In the brief historical introduction to the bibliography, two names are mentioned—Viollet-le-Duc and Roger Fry—as having "tried their hands at the complex problems of New World antiquity." The selection of these two only, among the considerable number of scholars, part of whose work has just been described, is beyond comprehension; one would have expected a wider catalogue or none at all. And from this neglect to reflect even perfunctorily on the long list of precursors who approached the subject from the art angle, the compilation draws unto itself undue emphasis.

Viollet-le-Duc's confused writing of about eighty years ago on our subject does not deserve inclusion. This French architect proved with his pseudo-Gothic "reconstructions" of cathedrals that he lacked true feeling for the earlier periods of art even in his own native land. It is absurd to class Roger Fry with him in the statement that both "lacked the authority of real association with the materials." Roger Fry had very real association with the materials; at his disposal were the collections and photographic archives at Cambridge and Oxford Universities, as well as those of the museums of London, Liverpool, and Glasgow. From the esthetic point of view, England at that time probably had the most approachable and varied pre-Columbian material of any country. Roger Fry's wide and mature grasp of the arts of various cultures throughout the world—as demonstrated for our field in the excerpts just quoted—give his work an "authority" still unexcelled in many respects; his books are still widely used here as well as in England, because nothing better along the same lines has been written.

Of course Roger Fry, Slade Professor of Art at Cambridge University, England, was not a "professional" art historian, as the term is narrowly interpreted and exclusively used within certain circles today. In Roger Fry's day a distinction was also made, but that was between good and bad art historians.

To make a prescribed academic background the sole criterion of authority in any field is unconstructive; to use it as a weapon will prove more often damaging than beneficial. One of the greatest archaeologists in the pre-Columbian field, whose brilliant talent in identifying objects at a glance by their style amazed and edified us all, started as a floor-walker in a Boston shoe store. Another, a truly original and valuable contributor toward the deciphering of Maya glyphs, was an insurance man from Connecticut. A great linguist and ethnologist in the Americanist's field made his living until recently as an automotive engineer. The feeling for styles cannot be taught beyond a certain point; neither can vision, nor the faculty of storing up countless individual objects in the memory. Aside from the American archaeologists who have been working quietly but effectively for more than half a century, it has been the "non-professional" outsiders who have noticed and popularized pre-Columbian art in this country. Newspapermen, librarians, medicos, painters, sculptors, authors, moving picture directors, architects, art critics and dealers, amateur collectors, trusting their own eyes, reacting to their own emotions, have submerged themselves in this rewarding field with an enthusiasm born of conviction.

As welcome as is any new contribution in the field of Americanistic studies, it is necessarily open to examination as to its worth. The following year there appeared, from the same hand as the bibliography just discussed, a second article, "The Cycle of Life and Death in Metropolitan Aztec Sculpture."[9] This comes as an original contribution, but it is sorely lacking in the authority of real familiarity with the

[8] George Kubler, "Periodical Literature on Latin American Archaeology 1940–1942," *The Art Bulletin*, Vol. 24, No. 2, pp. 181–185.

[9] *Gazette des Beaux-Arts*, May, 1943, pp. 257–268.

material. The tendency to *ex cathedra* speaking is again perceptible. More to be deplored, however, is a tendency toward an arbitrary complication of the subject, for to make a distinction between metropolitan, suburban, and provincial Aztec sculpture is hardly justifiable. Of the fourteen objects illustrated, nine are from the Museo Nacional, Mexico, D.F. Anyone who has sat down with staff members of that museum in search of documentation knows that the overwhelming majority of pieces that came into the museum's possession before the present regime are without much serious data on provenience; the most that can be offered is based on hearsay and approximation. Further, of the other carvings illustrated, the Xipe mask in the British Museum is not Aztec at all but from Texcoco, the provenience of the jadeite mask from Peabody Museum, Harvard University, has been questioned, while the serpent from Vienna is listed in that museum's catalogue merely as "Mexiko." Thus, where no metropolitan style can be distinguished, the construction of a new classification is uncalled for.[10]

The article abounds in careless and untenable statements; for instance, Montezuma "converted rule by council into the forms of absolute dynastic government," when, on the contrary, eyewitness reports relate his quarrels and vacillations in the council of "kings" and chiefs at the time of Cortes' first stay in the capital. Further, "plant forms were frequently represented by the Aztec sculptor." Out of the hundreds of carvings definitely Aztec, not a dozen can be identified as portrayals of plants.

We read that "Tenochtitlan was founded only c. 1325 and for another century its society lacked the resources, the leisure, and the stability to produce monumental sculpture." The date in this sentence bears a footnote, but no argument is offered to substantiate the sweeping statement that follows it. Where is the proof that the Aztecs, who adopted rapidly the cultural achievements of their neighbors (consider the revelations in the excavations at Cholula, Tenayuca, etc.), required a hundred years to start producing monumental sculpture.

Again, "the experience of other cultures and styles teaches that the image of the deity is the portrait of perfected man." Overlooked are such gods as Janus and Pan in the classic world; the gods of Egypt with the heads of hawk, bull, cow, ram, ibis, or jackal; the Hindu divinities, some with five heads, others with half a dozen arms; those of Tibet, with limbs as numerous as the spokes of a windmill; and those of Khmer, Cambodia, with three bodies facing in three different directions.

To elevate a chosen subject by disparaging kindred themes is a symptom of immaturity, alas not infrequently met with nowadays in the humanities. This attitude is especially unfruitful in our field, where the mosaic is far from complete and reconstruction is still going on. It is stated that "in Maya art, the repertory of human expression contains types analogous to those of Buddhist art, limited by the contemplative, introverted figures of the stelae on the one hand and on the other by the apotropaic countenances of monsters." Such an assertion could not be made by anyone who ever looked with seeing eyes at Maya figurines or frescoes. Enthusiasts of Peruvian art will be surprised to find that "in general Mochika pottery tends rather toward caricature at a low level of generalization."

Such pompous phrases as "empiric observation," "syncretic assembly," "vitalist concept," and "monstrous metamorphoses" tend only to obscure the subject. But the prize in art-historical ventriloquism goes to the following: "In the standing figure of the Museum of American Indian the minimal vitality of the wearer is countered by the empty, dead flaccidity of the garment of human skin. A state of tension exists between the garment and its wearer, between surface and substance, between appearance and reality." The reader should try seriously to grasp the sense behind this—a unique case in which a lifeless object, the garment, has tension in relation to an animate object.

In conclusion, a picture from the Codex Florentino is presented, showing the Aztec rite of human sacrifice, with the heart torn out of the victim's breast and held to the sun. "Man was the consumer of plants and animals but he was also the producer of divine sustenance (human blood)." The final sentence reads: "Mankind was distinguished from the remainder of creation by a godlike responsibility, expressed in the forms of the highest, even repulsive austerity, since man himself was the eucharist." Man was not so distinguished; from Sahagun himself, whose illustration is

[10] J. Eric S. Thompson calls my attention to the fact that sculpture in Tula style was recently excavated in Mexico City.

shown, we know that animals also were sacrificed and thus apparently also produced "divine sustenance." But apart from the misstatement, to compare one of the most savage physical practices of history with the most sublime metaphysical rite of the Christian religion is out of taste and highly insulting, especially to Roman Catholic Latin America. The lack of grasp of Aztec history might be excused but not the lack of sensitivity in the field of Mediterranean cultures in which the "professional" art historian should be well informed.

The mistakes of these two papers and their presumptuous tone would have been put down to the tyro's lack of self-criticism, had not a third article appeared very recently from the same quarter under the title, "Remarks upon the History of Latin American Art."[11] The very first paragraph starts off with the accusation: "Peculiar circumstances have inhibited the art historian's interest in the many epochs and regions of Latin American art. Until recently, the collections were hardly to be found in art museums. Available objects had long since been *intercepted* by the anthropologists and natural scientists." (Italics mine.) Is this what the long procession of indefatigable Americanists has been doing—from Maudslay, intrepid trail-breaker, to the young archaeologists of the Institute of Andean Research, traveling afoot and on muleback, living on the bare necessities of life, and enduring extreme altitudes to add new data to our knowledge—they have been intercepting objects and preventing them from reaching the attention of some "professional" art historian in his air-conditioned library? They put the objects, as we read, often among exhibits of "stuffed whales and shrunken heads," not into art museums where handy catalogue and bibliography might have served to overcome the "professional" art historian's "inhibitions."

The Americanist of this country may well ask whether this is a seemly way for a newcomer to make his entrance into an established and distinguished field of the humanities. As a matter of fact, pre-Columbian material has been exhibited for a considerable time in art museums, in company with products of the highest civilizations of Near East and Far East. A list of some of the exhibitions gathered with only cursory effort is here given.

[11] *College Art Journal*, May, 1944, pp. 148–152.

The Museum of Fine Arts, Boston, received its first pre-Columbian Peruvian textiles as a gift in the 1870's. Later, through the enthusiasm of Dr. Denman Waldo Ross of Harvard University, the collection was considerably enlarged. Dr. Ross's approach was that of an artist, not that of an archaeologist, and his point of view helped to shape the policy of the museum in this field. Since 1931 repeated purchases of such material were made by the Trustees. The museum has had in its possession for decades a very fine group of pre-Columbian gold objects from South America.

Pre-Columbian Peruvian textiles have been on exhibit in The Metropolitan Museum of Art, New York, since the 1880's, when a number were received as a gift from the Marquand bequest. The collection has been enlarged again and again through purchase; these pieces were bought as works of art for their fantastic techniques and were always treated as equals with the highest weaving achievements of the rest of the world.

In one of the large rotundas at the Panama-California Exposition of 1915—incidentally, the buildings were in good Spanish Colonial style—an entire hall was devoted to replicas of great Maya monuments. The famous Tikal wood panel was reproduced here, and some of the temples were shown in models made after the designs of W. H. Holmes. On the walls, impressive murals showed panoramic views of six famous Maya sites.

At its opening in 1899, the University Musuem in Philadelphia had a hall of American archaeology. In the 1920's emphasis began to be laid on the artistic presentation of the growing pre-Columbian collection there, together with masterpieces of Egypt, China, and Babylon. The Cleveland Museum of Art has had pre-Columbian objects on exhibit since 1920, and by 1930 it had started acquiring outstanding pieces. In the new building of the Fogg Museum of Art, Cambridge, Massachusetts, opened in 1927, a special room with no intercommunicating doors was dedicated to Middle American art. There pre-Columbian sculpture, gold, and jade have as neighbors Quattrocento panels and Romanesque sculpture.

In 1930, The Metropolitan Museum had a special exhibit of pre-Columbian work that included textiles, gold and silver, and pottery. In 1931, the Exposition of Indian Tribal Arts in New York, arranged at the instigation of the

painter, John Sloan, stressed the beauty in the prehistoric and colonial art of our Southwest. This same year also saw a fine exhibit of Middle American and Peruvian art at the Century Club, New York. In 1933, there was an exhibit in the old building of The Museum of Modern Art, "American Sources of Modern Art," which covered our field from Mexico to Peru. Their catalogue, with its enlightening introduction and the high quality of its illustrations, set a standard for all subsequent expositions. In 1935, the Brooklyn Museum opened its pre-Columbian galleries in the milieu of true art. The Wadsworth Athenaeum at Hartford had a showing of "Ancient Peruvian Art" in 1937, and the Baltimore Museum of Art in the same year presented its "Art of the Maya." In Ann Arbor, the University of Michigan arranged an exhibit of Latin American and pre-Columbian art in 1939, and that year also saw the art works of pre-Columbian civilization shown at The Cleveland Museum of Art, as well as at the San Francisco Exposition, placed at the latter among the Pacific cultures with those of China, Japan, and Siam. The following year the Fogg Museum of Art had an exhibition of pre-Columbian art, in which pieces of unusual artistic merit were brought together. Contemporaneously, the Los Angeles County Museum presented its "Pre-Columbian Art," with very fine material. Among early European exhibits which emphasized the artistic, that at the Louvre, in 1928, and another in Berlin, in 1931, should not be overlooked.[12]

As we see, even before the 1930's, with their faster-pulsing museum activities, pre-Columbian art was noticed, exhibited, and admired in many circles in this country. If the "professional" art historians here have until so very recently remained untouched by the beauty and importance of this art, they should blame no one but themselves. One reason for their hesitancy may be, as we read in the same article, the "danger that the inclusion of American materials might complicate even further an already confused schedule of times and places." But is it justifiable to halt research and study out of fear that in confused heads the confusion will be augmented?

[12] Mention should be made also of the publications brought out and the exhibitions arranged in Spain, Mexico, Peru, and Argentina, where the presentation of rich material from public and private collections started relatively early the movement toward the appreciation of the art of pre-Columbian America.

The writer of the article goes on to ask "whether Latin American studies will survive the sudden political emergency of four years back." The question is timely now, when our Good Neighbor Policy is at the crossroads. This doubt does not live, however, in the minds of the anthropologist—archaeologist or ethnologist. Their friendship with Latin America is already firmly established on the basis of the positive contribution they have already made. Whether the art historian in this country holds up his end depends entirely upon himself. It should be pointed out that a number of Latin American universities are equipped with an Instituto de Investigaciones Estéticas.[13]

Contrary to the statement, "Archaeology itself is not an academic discipline but a technique,"[14] the truth is that American archaeologists today are turning more and more into culture historians; their wide experience, digested knowledge, and mature observation have given them a grasp of the subtle inner structure of their subject. On the other hand, there is a type of art historian in the making here whose work, without the broad and edifying implications of a humanistic discipline, is hardening into a mere technique, sterile and skeletonized.

In Europe, where a great tradition of connoisseurship was established long ago, strict specialization may have been fruitful, but this is not true here, where not only the public but the fledgling scholar is apt to lack the necessary broader attitude in esthetics and a real sense of history. Our educational authorities have just now begun to emphasize the devastating effect of early specialization and the striving after the absolute, which, in the case of art historians, have failed to develop imaginative vision and an all-round harmonious conception of esthetics. For the purpose of art history is more than the collection of bibliographical notes, facts, and figures from other sources. It involves interpretation, esthetics, and philosophy. The system whereby the art historian assembles and classifies his material should never be allowed to become dominant. He is first of all a humanist; he leans on science, it is true, but if science becomes his goal he is no longer an art historian.

[13] At the University of Seville, Spain, a department of history of Hispano-American art was founded in 1930 and has since been maintained in growing volume.

[14] See footnote 8.

There is no field for rivalry between archaeologists and art historians; they complement each other. The archaeologist constructs the known out of the unknown; the art historian interprets that known in its relation to the arts of the rest of the world and to present-day mankind—for man needs art for his daily living and progress. The study of externals is only a means to the spiritual and emotional experience of art. But to interpret art, one has first to see, understand, and love it. Only then is he ready to be the intermediary who, through the filter of his perception, can make alive the beauty of his subject to the public.

In the pre-Columbian field the art historian has a positive contribution to make. His experience with the esthetic can lead deep into the analysis and differentiation of styles. He can turn the light of his knowledge of other arts upon pre-Columbian art to illuminate its great originality and, in an articulate literary style—a requisite of the art historian from Ruskin to Berenson and further—can bring its psychological apartness into focus for a wider public. When his contribution is added to that of the other branches of Americanistic studies, then we can hope that pre-Columbian art will attain its deserved place and be reckoned by all, not among the "primitive" or the "exotic," but among the great arts of the world.

Norfolk, Connecticut
January, 1945

THE SIDEY-MACKAY VILLAGE SITE

W. J. WINTEMBERG*

THE Sidey-Mackay village site, excavated by the author in 1926, is located on the farms of Messrs. William F. Sidey and John A. Mackay, on Lot 8, Concession V, Nottawasaga Township, Simcoe County, Ontario, about one mile west of the village of Creemore, in territory known to have been inhabited by the Tionontati Indians, or Tobacco Nation, a tribe of the Iroquoian stock. This site, unlike many in the same area, had suffered little from the depredations of collectors; an instructive representative collection was secured. Additional material was collected by the writer from the surface of the Mackay farm in 1923.[1]

The village was probably occupied after 1615, the year of Champlain's visit to the Tionontati country, but occupation lasted only a short time after the arrival of French traders, because only one article of European origin was found—a piece of sheet brass which was buried in a refuse deposit. Even that may have been introduced accidentally. No glass or porcelain beads and no iron axes, so abundant in post-European sites nearby, were found.

The site occupied most of a more or less level plateau; steep banks, sloping at an angle of 40 degrees limit most of the area. The surface was about forty feet above the level of the road which runs west of Creemore. Part of the Mackay half of the site was level, but it sloped sharply at the east and more gently at the west and southwest. The southeast side was overlooked by a high hill. The portion on the Sidey farm had been under cultivation since about 1908. The soil was a sandy loam. Before it was cleared, the site supported a stand of beech, maple, hemlock, and a lone pine tree. Eighteen refuse deposits were found, twelve of them on the Mackay farm. Two were small, shallow deposits that extended part way down the steep banks to the north. One deposit, about thirty feet long and one foot deep, at the west end of the site, was exposed by an earth slide. Another (No. 5), on a lower level than the rest, was possibly more recent, for in it was found a piece of European sheet brass. None was more than eighteen inches deep, the majority were much shallower. At the bottom of most of the six excavated deposits was a layer of ashes 2

* This paper, which was found in Mr. Wintemberg's files after his death, was delivered to the Editor by Dr. Douglas Leechman of the National Museum of Canada who has read proof.

[1] The writer's thanks are here gratefully tendered to Messrs. Sidey and Mackay for permission to excavate on their properties, and to Mrs. F. E. Webster, Creemore, for securing permission to excavate from the owners. Dr. A. Wetmore, Assistant Secretary of the Smithsonian Institution, kindly identified most of the bird bones, and Dr. Remington Kellog, Assistant Curator of Mammals, U. S. National Museum, identified some of the mammal bones.

to 3 inches thick and a few scattered patches of carbonaceous matter which contained charred beans, squash stems and cobs and kernels of corn. The deposits from the surface down to the ash layers consisted of mixed ashes and black dirt in which, mostly below plow depth, were found the potsherds, pipes, and artifacts of stone, bone, antler, tooth, and shell described elsewhere in this report. Some of the deposits were unusually barren, yielding very little beyond a few small pottery fragments and animal bones.

The site was in a defensible position and was no doubt surrounded by a palisade,[2] the shape of the enclosure depending upon the nature of the ground. Mr. Herbert Webster, of Woodstock, Ontario, claimed that the stumps[3] of what he thought were the posts of the palisade could be seen protruding from the ground along the north side of the site when the field was first cleared. The most positive evidence of the existence of palisades, however, was in the form of post molds below the refuse in deposit 6. Owing to the fact that the rest of the field was in pasture, it was inadvisable to trace the post molds beyond the limits of the excavation; excavations at several places along the north side, where the stumps were seen by Mr. Webster, revealed none. Some of the molds found in a row in deposits 5 and 6 probably marked house walls.

RESOURCES AND MATERIALS USED BY THE PEOPLE

The explorations yielded evidence of the various natural products on which the people here depended for food and for materials from which they made weapons for the chase, various kinds of tools, ornaments, objects used in games, and pipes for smoking.

Foodstuffs

Vegetal foods. The vegetal remains indicated that both wild and cultivated plant foods were used by the inhabitants of the Sidey-Mackay site. Four pits of the wild plum, varying in size, a fragment of a butternut, and a fragment of an acorn, the latter long and pointed, give some evidence of wild fruits and nuts which were eaten. Cultivated vegetal foods are represented by carbonized cobs and grains of corn, about eighteen beans, two sunflower seeds, and five squash stems. There seemed to be at least two varieties of corn, judging from the shapes of the grains, some of which were round and some flattened on the sides; both kinds, however, may have grown on the same cobs. The smallest kernel was $\frac{7}{32}$ inch long and $\frac{1}{4}$ inch wide, the largest was $\frac{11}{32}$ inch long, $\frac{3}{8}$ inch wide, and $\frac{5}{16}$ inch thick. Very few cobs were complete, but all appear to have been less than 3 inches long. The diameter of the smallest was $\frac{3}{8}$ inch, that of the thickest, $\frac{15}{16}$ inch by $1\frac{5}{16}$ inches. About half of the cobs bore eight rows of kernels, a few others had five or six rows, and a few seemed to have had seven or nine rows. Corn was not as plentiful here as at the Roebuck village site and at a post-European Tionontati site about one mile northeast of the Sidey-Mackay site, where a pit, 15 by 30 feet in diameter and over 2 feet deep, was filled with a solid mass of carbonized kernels which came out in large chunks. The beans were of the same variety as those found in the Roebuck village site.

Animal foods. Animal remains were of mammals, birds, reptiles, amphibians, fish, and freshwater clams. In many cases the bones were broken into such small pieces that it was difficult to identify them. Bones of mammals were the most plentiful, but whereas bones of deer are most abundant in collections from other Iroquois sites, in the Sidey-Mackay collection, bones of deer took second place. The species represented were beaver, Virginia deer, bear, domestic dog, woodchuck, wapiti, muskrat, red squirrel, hare, raccoon, pine marten, red fox, gray squirrel, chipmunk, fisher, lynx, wolf, skunk, and porcupine (the presence of the latter indicated by a few incisor teeth only). Most of the bones of the deer, wapiti, and beaver skeletons were present.

Bird bones, some of which could not be identified because they were in splinters or lacked the joints, included those of the following species, in order of abundance: passenger pigeon, ruffed grouse, wild turkey, Canada goose, crow, and raven.

There were bones, mainly parts of carapaces and plastrons, of three species of turtle—the painted, the snapping, and the wood—and a few of an amphibian about the size of a leopard frog.

[2] Champlain, 1922–1932, vol. VI, p. 248, says the Tionontati villages were "enclosed by tree trunks."

[3] A circular enclosure on Lot 26, Concession VIII, Beverly Township, Wentworth County, Ontario (See Boyle, 1888, p. 11), was indicated by post holes in which decayed fragments of the wooden palisade posts could still be detected. See also Beauchamp, 1900, p. 27.

Bones of the following species of fish could be recognized: sand pickerel (*Stizostedion vitreum*), pike (*Lucius lucius*), common catfish (*Ameiurus nebulosus*), gar pike (*Lepisosteus osseus*), and sheepshead (*Aplodinotus grunniens*).

The following species of shell fish, represented by their shells, were found: *Elliptio complanatus* (the most abundant species), *Elliptio dilatatus*, and *Lampsilis silicoidea*. There were a few shells also of a fresh-water snail (*Campeloma decisum*), but the animal may have been too small to be used for food.

Raw Materials

The materials used by the people of the Sidey-Mackay site in the manufacture of artifacts were about the same as those found at other Iroquoian sites so far explored, and consisted of rocks and minerals, bone, antler, shell, teeth, and vegetal materials. The piece of European sheet brass mentioned above may have been introduced into deposit 5 during the course of cultivation, for it was found at a depth of less than a foot.

Rocks and minerals. Rocks and minerals were used in the manufacture of articles of both utility and ornamentation. Chert was the most extensively used: of this, there were over 300 chips, light to dark gray in colour, some almost like limestone in appearance, less than one-third showing secondary chipping; thirty-nine arrow points; a crude drill point; forty-seven scraper blades; and twenty-one small crude forms of various shapes, five of them probably in process of manufacture into arrow points, one into a drill, and one into a scraper. Of chalcedony, there were a crude unfinished object and thirty-eight chips, of which six showed secondary chipping. Although there were a few chips of quartz and quartzite, excavation uncovered no artifacts chipped from those materials; a few pebbles of quartzite, however, were used as hammers and mullers. There were a few large pieces of black mica, but none was cut into shape. Hematite, of which one nodule was found, was probably used in making face paint. Limestone was used extensively for mullers, mortars, adzes, hammers, a whetstone, a scraper, beads, a pendant, and pipes. There were a few unfinished artifacts of this material, including a piece showing cutting. Sandstone was used principally for whetstones and beads (Pl. XIX, D, *11*), but it was also made into an adze, a few hammerstones, an anvil, an object of unknown use, two

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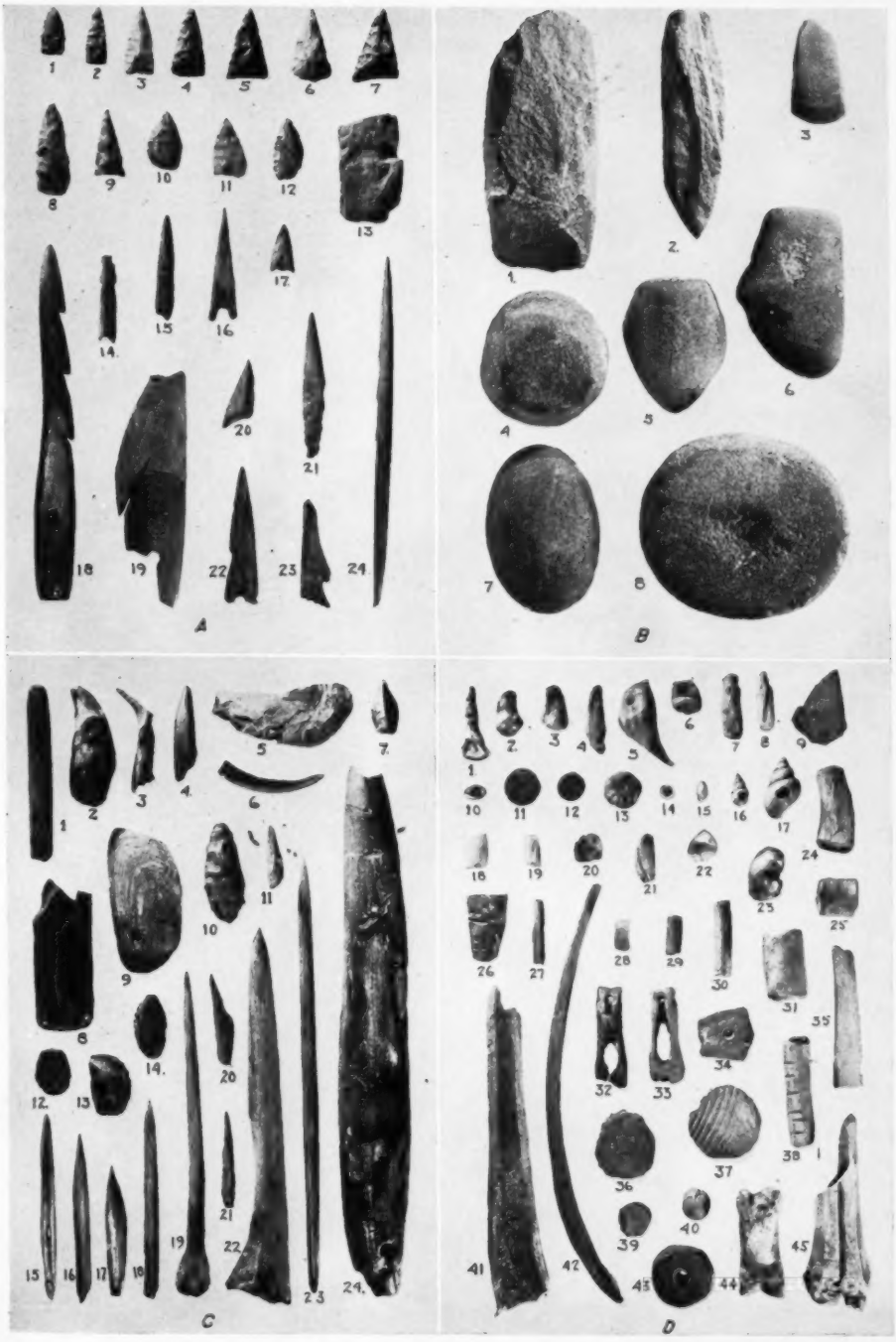
Artifacts from the Sidey-Mackay site (approximately ¼ natural size).

A. Implements used in securing and preparing food: *1–12*, chert points; *13*, sandstone net sinker; *14*, bilaterally barbed socketed bone point; *15*, broken bone point; *16*, *17*, slotted and barbed antler points; *18*, unilaterally barbed antler harpoon point; *19*, fragment of large harpoon point, possibly unfinished; *20*, barb from massive harpoon point; *21*, antler barb (?); *22*, *23*, fragments of antler harpoon points; *24*, unusual type of unilaterally barbed bone point. (*1*, *2*, *4*, *6*, *7*, *9*, *16*, *18*, *20–24*, excavation 6; *3*, *12*, *13*, *19*, excavation 5; *5*, excavation 1; *8*, *10*, excavation 3; *11*, excavation 8; *14*, excavation 2; *15*, *17*, excavation 4.)

B. Tools used by men: *1*, unfinished stone adz or ungrooved ax; *2*, reworked adz or ax; *3*, stone adz or chisel; *4*, *6*, *7*, hammers; *5*, unfinished object, perhaps a pipe; *8*, pitted muller and hammer. (*1*, excavation 1; *2*, *6*, from surface; *3*, excavation 2; *4*, *7*, excavation 3; *5*, excavation 6; *8*, excavation 5.)

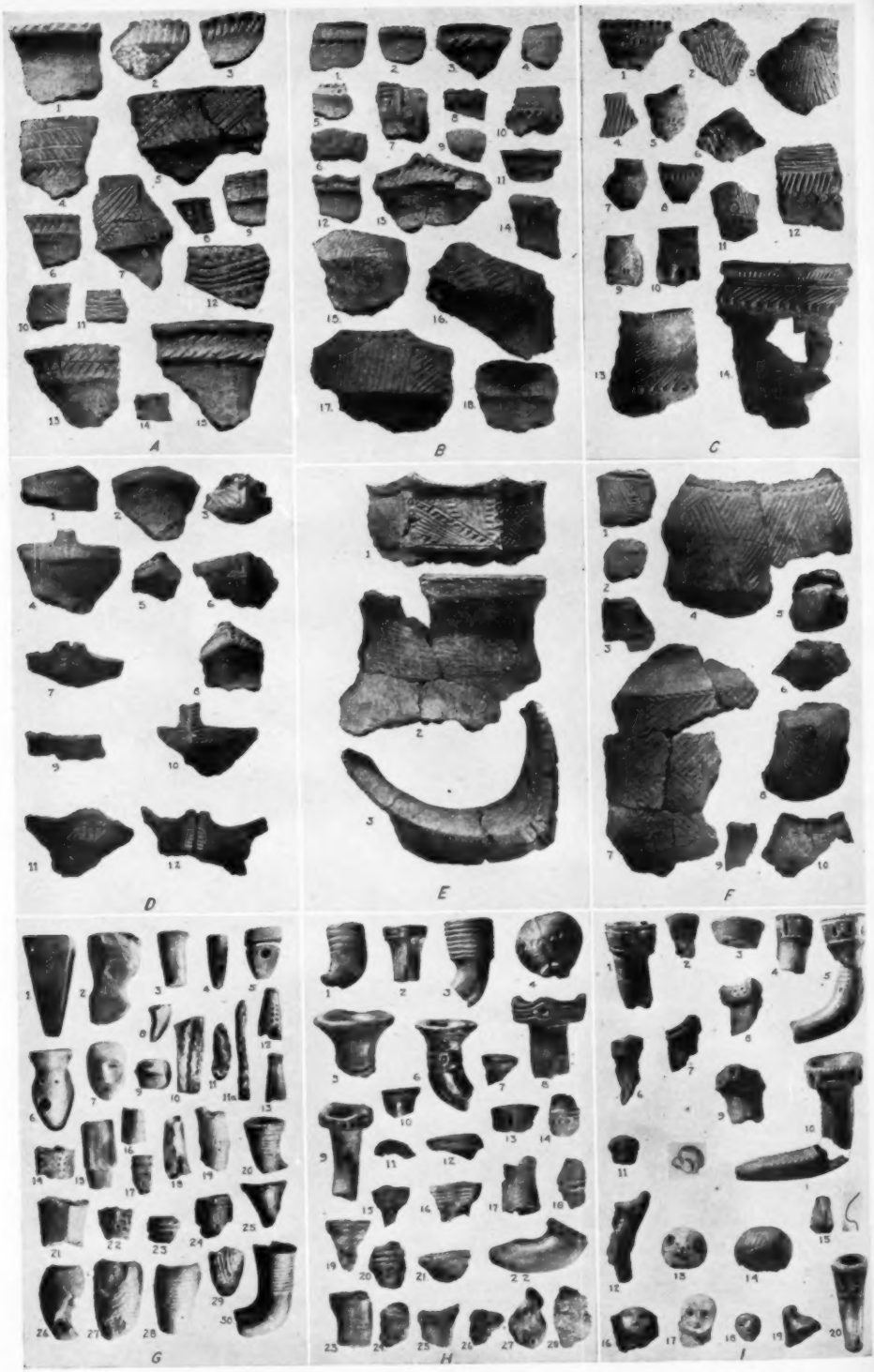
C. Implements used by men and women: *1*, chipping tool; *2*, *3*, modified and utilized teeth of the bear; *4*, tip of antler tool; *5*, *7*, *10–14*, chipped chert; *7* is a drill; *10–14* scrapers, *11*, in edge view; *6*, modified lower incisor of beaver; *8*, fragment of bone fleshing tool; *9*, utilized shell of fresh-water clam; *15*, eyed bone netting needle; *16–23*, awls, *19*, from bear fibula, *21*, from metacarpal of dog, *22*, from human right ulna; *24*, large dagger-like antler object, perforated at one end. (*1*, *10*, *12*, *21*, *23*, excavation 2; *2*, *6*, *7*, *18–20*, excavation 3; *3*, excavation 5; *4*, *5*, *8*, *9*, *11*, *13*, *14*, *17*, *24*, excavation 6; *15*, *22*, excavation 8; *16* from surface.)

D. Articles of adornment, games and miscellaneous. *1–6*, notched or perforated teeth, *1–3*, of the wapiti, *4*, of the dog, *5*, *6*, of the bear; *7*, grooved limestone pendant; *8*, fragment of worked marine shell; *9*, fragment of antler armlet; *10–14*, discoidal beads, *10*, soapstone, *11*, sandstone, *12*, earthenware, *13*, *Unio* shell, *14*, from columella of marine shell; *15–19*, *22*, shell beads, *15*, *Goniobasis livescens*, *17*, *Campeloma decisum*, *18*, *19*, from columella of marine shell, *22*, unfinished blank from shell of freshwater clam; *20*, *21*, beads made from a tooth of the wapiti and dog; *23*, object made from shell of freshwater clam; *24*, unfinished bead made from humerus of the dog; *25*, bead made from stem of earthenware pipe; *26*, *34*, slate objects; *27–31*, *38*, bone beads; *32*, *33*, flattened proximal phalanges of deer; *35*, *42*, notched or marked deer ribs; *36*, *43*, sandstone disks; *37*, *39*, potsherd disks; *40*, marble-like object of earthenware; *41*, *45*, cut or sawed bone; *44*, proximal phalanx of wapiti, with proximal end ground. (*1*, *14*, *15*, *18*, *20*, *21*, *28*, *31–33*, *35*, *37*, *39*, excavation 3; *2*, *7*, excavation 4; *3*, *6*, *8*, *9*, *11*, *12*, *22*, *23*, *25*, *26*, *29*, *30*, *40–42*, *44*, excavation 6; *4*, *38*, excavation 8; *5*, *27*, excavation 1; *10*, *34*, *36*, *43*, excavation 5; *13*, *17*, *45*, excavation 2; *16*, *24*, from surface.)



Artifacts from Sidey-Mackay site.

(*National Museum of Canada*)



Potsherds and stone and earthenware pipes from Sidey-Mackay site.

(National Museum of Canada)

other objects that may have been net sinkers, a pestle, a few disks (Pl. XIX, D, *36*), and an effigy pipe (Pl. XX, G, *9*). Only a very few artifacts were made of the local Nottawasaga red sandstone, commonly used at post-European Tionontati sites. Hornblende schist and micaceous schist, especially the first, were made into adzes; a cobble of micaceous schist was made into a muller. Slate was used for adzes, a whetstone, a discoidal bead, and other objects that were never finished. Granite, gneiss, diabase, greenstone, and a species of gray rock were made into a mortar, mullers, and adzes. Soapstone or steatite was used for a few pipes and a bead; this material was probably brought from somewhere east of Lake Simcoe.[4] Clay for pipes, pottery, and beads was evidently obtained from local deposits. There was an exposure of pure clay in the valley of a little creek that flowed from the west of the site.

Materials of animal origin. The materials of animal origin comprised bone, antler, teeth, and shell. Artifacts of bone were less abundant than at the Roebuck village site. The people seem to have been either unusually poor or unusually thrifty as compared with those at other sites, because very little unworked split bone was found, and that, mostly from deer. Pieces of thirteen deer metapodials and two splint bones were made into awls; one splinter, into a knife-like tool; one, into a pointed tool; three proximal phalanges, into what were probably units for cup-and-pin games; and twelve others, one of which is unfinished, into flattened objects possibly also used in a game. Parts of fourteen other artifacts, including the fragment of a metapodial in Plate XIX, D, *45*, showing cutting, were likewise derived from deer bones. Four pieces of metapodials of the wapiti were made into awls. From four proximal phalanges objects of two kinds were made, of which one (Pl. XIX, D, *44*) may have been used in a game; the others possibly were used as pipes. Several dog bones furnished material for artifacts; a metacarpus, an ulna, and a fibula had been converted into awls; part of a humerus, a femur, and two tibiae into beads; and a section of another tibia into a tubular object possibly also a bead (Pl. XIX, D, *38*). Other worked dog bones included a lower jaw from which both ends had been severed; one humerus which lacked the lower two-thirds of the shaft; a fragmentary radius, roughly pointed at one end; and one proximal and two distal joints of tibiae separated from the shafts by scoring and breaking. Awls were made from a fibula and an ulna of both the bear and the raccoon. A splanchnic bone of a raccoon was polished from use. The brain case had been broken from the skull of a wolf, leaving more or less uneven edges on the intact palatal portion of the upper jaw and occipital bone; the use of this specimen was uncertain. The only human bone from which an artifact had been made was an ulna, sharpened at the distal end (Pl. XIX, C, *22*). Twenty-seven awls; one arrow point; five harpoon heads; twelve netting needles; a sliver used as a scraper; one used perhaps as a handle; two ribs, one with notches on one edge and the other with transverse incisions on one side (Pl. XIX, D *35* and *42*); and another with one end rubbed to a blunt point were derived from bones of unidentified mammals.

[4] There is an outcrop of gray soapstone in Lot 1, Concession A, Somerville Township, Victoria County, Ontario.

Potsherds and stone and earthenware pipes from the Sidey-Mackay site (approximately 1/6 natural size).

A–F, sherds from the following excavations: excavation 1, A *12*, B *3*, F *7*; excavation 2, A *4*, *6*, *8*, B *1*, C *13*, D *4*, F *3*; excavation 3, A *10*, *11*, *13*, *15* B *4*, *7*, *9*, *14*, *18*, C *5*, *6*, *8*, *11*, *12*, D *1*, *3*, *5–10*, *12*, F *1–3*, F *5*, *6*, *8*; excavation 4, A *3*, B *16*, *17*, C *3*, F *1*; excavation 5, A *1*, *5*, *7*, B *2*, *13*, C *2*, *10*, D *2*; excavation 6, A *2*, *9*, *14*, B *5*, *6*, *8*, *10*, *11*, *15*, C *1*, *4*, *7*, *9*, F *9*, *10*; excavation 7, B *12*, C *14*, D *11*; excavation 8, F *2*, *4*.

G–I, Pipes and fragments of pipes. G *1*, *2*, unfinished slate and stone effigy pipes, *3–7*, stone pipes and fragments, *8*, probably part of unusual earthenware pipe, *9*, fragment of sandstone owl effigy; *10*, fragment of stem of earthenware pipe with impression of cord in hole, *11*, *11a*, casts of fascine-like core and cord impressions from holes in stems of pipes, *12*, *13*, *15*, *16*, *18*, fragments of stems, *14*, *17*, *19–30*, bowls or fragments of bowls of earthenware pipes; H *1–21*, *23–28*, bowls or fragments of bowls of earthenware pipes, *22*, stem of earthenware pipe; I bowls or fragments of bowls, *11*, crudely modeled head, possibly of an owl, *12*, mammal head from bowl, *13*, owl head from bowl, *14*, back of owlhead from bowl, *15*, nose broken from human face mask, side view in outline, *16–18*, human mask and faces from bowls, *19*, fragment of face mask from bowl, *20*, bowl with two human faces. (Excavation 1, G *6*, H *6*, *16*; excavation 2, G *20*, *23*, *24*, *38*, H *9*, *10*, *24*, *25*; I *2*, *12*, *18*; excavation 3, G *1*, *3–5*, *7*, *13*, *15*, *16*, *18*, *21*, *22*, *26*, *27*, *30*, H *3*, *4*, *7*, *8*, *13*, *14*, *22*, *26*, I *4*, *6–8*, *10*, *17*; excavation 4, I *9*, 13; excavation 5, G *17*, *25*, H *20*, *21*; excavation 6, G *8*, *9*, *12*, *14*, *29*, H *1*, *2*, *15*, *19*, *23*, *27*, *28*, I *1*, *3*, *5*, *11*, *14–16*; excavation 7, H *12*, I *19*, *20*; excavation 8, G *2*, H *5*, *11*, *17*, *18*, from surface, G *10*, *19*.

Twenty-seven specimens, including points for arrows and harpoons, awl-like tools, an armlet, and a few artifacts of unknown use, were made of antler.

Incisors of beaver, porcupine, and woodchuck were used as chisels and knives; canine teeth of bear, dog, and wapiti, a bear molar, and deer incisors were made into pendants by either notching or perforating the root; dog and wapiti canines were made into what seemed to have been beads; and two bear canines had the crown artificially modified for some unknown use.

Shells of freshwater clams were less extensively used than at the Lawson village site. A few half-shells of *Elliptio dilatatus* and *E. complanatus* were used as scrapers, and eighteen others seemed to have been smoothers. Pieces of shells of other clams were made into discoidal beads and other ornaments; twenty-one shells of *Campeloma decisum*, eighteen of *Goniobasis livescens*, three of *Pleurocera acutum* (all freshwater snails), with holes for suspension broken through the lips, were used as beads; the shell of a small marine snail (*Marginella apicina*) was also made into a bead; and columellae of large, unidentified marine shells furnished material for two discoidal and six cylindrical beads and what was probably a pendant.

Vegetal materials. There were several pieces of charcoal; a few charred pieces of what looked like pine bark; about a dozen pieces of birch bark, some of which may have been parts of receptacles, although none showed stitch holes; and five rolls of the same kind of bark, one of them $1\frac{9}{16}$ inches wide and $3\frac{1}{2}$ inches long, which possibly were parts of torches.

TOOLS USED IN EXPLOITING RESOURCES

Securing of Food

The artifacts from the Sidey-Mackay site used in securing food consisted of arrow points of chert, bone, and antler; harpoon points of bone and antler; and two objects that were probably net sinkers. Although the Tionontati are known to have cultivated the soil, no artifacts that could have been used as hoes were found.

Chipped stone arrow points. Thirty-nine chert arrow points including twelve tips and three bases of broken points, were secured. They were leaf-shaped, triangular, and notched (Pl. XIX, A, *1–12*). Two points were leaf-shaped; one, with a straight base (Pl. XIX, A, *12*) and the other, curved from end to end, with a convex, slanting base (Pl. XIX, A, *10*). Twenty-four triangular points were found (Pl. XIX, A, *1–8, 11*), some crude, and others delicately chipped, one of them (*2*) thin, small, and slender. Bases of twelve were straight; of seven, slightly concave; two of them somewhat slanted; three had convex bases. Sides or edges of nine were convex, those of thirteen, straight. They were from $\frac{3}{4}$ inch to $1\frac{13}{16}$ inches long, $\frac{1}{2}\frac{1}{3}$ to $\frac{7}{8}$ inch wide, and $\frac{3}{32}$ to $\frac{3}{8}$ inch thick. Only two points were notched, both of them originally triangular and transformed by shallow notches on each edge near the base (Pl. XIX, A, *9*); tip and base of one were missing.

Barbed triangular points of antler. There were two barbed triangular points of antler. The lower part of each face on both points was hollowed to make the base somewhat wedge-shaped, for insertion in the split end of the arrow shaft. The edges and the tip of one (Pl. XIX, A, *17*) were sharp and $\frac{1}{8}$ inch thick. The other specimen (Pl. XIX, A, *16*) had rounded edges and a sharp tip and was $\frac{9}{32}$ inch thick. These points were like two specimens from the Roebuck village site, except that they were more triangular and wider across the base.[5]

Hollow bone point. A fragment of a specimen of hollowed bone, seen in Plate XIX, A, *15*, may have been part of a conoid point for an arrow.

Harpoon points. Of two whole and six fragmentary harpoon points, six were unilaterally barbed and one bilaterally barbed. One (Pl. XIX, A, *24*), made from a piece of bone grooved from end to end and roughly triangular in cross section, had a row of blunt barbs along the more ridged side. Though broken, the base was so tapered as to suggest that it was thrust into a hole in the end of the harpoon shaft. Two fragments, probably parts of similar artifacts, were without barbs. The writer knows of no similar points from other Iroquoian sites in Ontario and New York. There was a whole harpoon point of antler. It was of a more common type, lenticular in cross section and $\frac{1}{4}$ inch thick (Pl. XIX, A, *18*), with edges of the barbed part and the back almost sharp, the side

[5] See Wintemberg, 1936, Pl. I, Fig. 16. There is a similar but more delicate bone point from Simcoe County, Ontario, in the Royal Ontario Museum of Archaeology, Toronto (Cat. No. 31276, Provincial Museum collection).

not shown was cancellated. The biconical hole showed signs of wear from the chafing of the line or lashing that secured it to the shaft. Five fragmentary, unilaterally barbed points were included in the collection. One fragment looked like the base of a point. One, $\frac{1}{4}$ inch thick, short, and with two barbs ground until they were almost obliterated, showed the remains of a line hole at the broken end and the beginning of another just above it (Pl. XIX, A, *22*). One small fragment, $\frac{1}{4}$ inch thick, retained a broken barb (Pl. XIX, A, *23*). Part of an exceedingly wide specimen, $\frac{1}{16}$ inch thick, which retained a portion of the line hole (Pl. XXI, A, *19*) may have been in process of manufacture. There was also a barb broken from what must have been an unusually massive point about $\frac{5}{8}$ inch thick (Pl. XIX, A, *20*).

A fragmentary, bilaterally barbed specimen of hollow bone, with one barb intact on one side and two on the other, was unusual in that it had a barbed base and the marrow hollow served as a socket for the reception of the arrow shaft (Pl. XIX, A, *14*).[6]

As at most pre-European Iroquois sites, all the harpoons were multiple-barbed.[7]

A pointed bone or antler object with a hollow on one side and the larger end hacked and roughened (Pl. XIX, A, *21*) may have been used as a barb on some sort of harpoon; it is $\frac{7}{16}$ inch thick.

Net sinkers. An irregularly shaped slab of sandstone with notches on opposite edges was probably used as a net sinker, as was the grooved specimen in Plate XIX, A, *13*.

The Preparation of Food

There is no historical information respecting the methods of preparing and cooking food, both Champlain and the Jesuit Fathers being silent about this phase of the life of the Tionontati. As they were closely related to the Hurons, however, their cooking methods were probably the same.[8] The only artifacts used in the preparation of food were a knife, mullers and mortars for grinding grain, pottery in which the food was stored and probably boiled, and clam shells with worn edges which may have served as spoons.

Knives. A blade chipped from chert, $\frac{6}{16}$ inch thick, with a sharp edge on the more curved, and perhaps unfinished, side (Pl. XIX, C, *5*), may have been used as a knife to cut up meat.

Mullers. There were fifteen mullers or grinding stones of nearly circular, oval, or irregularly shaped cobbles, most of them with only one side flattened and with the peripheries battered; in most cases there was a pit in each face. Only a few were neatly shaped (Pl. XIX, B, *8*). These implements were probably used for cracking corn, and, as the flattened faces suggest, for grinding the corn into meal after it was cracked. Those with abrasions on the edges were combined mullers and hammers. One with an irregular shape seems to have been used also as an anvil.

Mortars. Two fragments of mortars were found, a very small one of limestone, and a larger, apparently oblong one of granite, $5\frac{5}{8}$ inches wide, and $1\frac{7}{8}$ inches thick, which was probably 8 inches long when whole, with shallow hollows $\frac{1}{4}$ inch and $\frac{3}{16}$ inch deep on both faces.

Pottery. No whole pots were found, but there were 12,370 fragments of rims, necks, shoulders, and bodies; the majority were body fragments. Many, especially body sherds, were split parallel with the surface, some perhaps by frost since they became buried. Two thousand three hundred sixty fragments of rims appertained to 1997 pots.

The pots varied in size from small vessels, an inch or so in diameter and height, which were presumably toys, to one $20\frac{1}{4}$ inches high, $17\frac{1}{2}$ inches wide across the top, and 19 inches in diameter at the bilge, with a capacity of about 20 gallons (Fig. 14, *e*). They were larger than any of those from the Roebuck village site but compared in size with those from the Uren village site.

So far as could be judged from the few nearly whole vessels and from the shapes of large fragments of others, four types of pots were represented. The simplest was a small cup-like vessel (Figs. 14, *a*, and 15, *a*). The collection included fragments of fifty-two vessels of this type, all of them, judged by their crudeness, made by children or beginners in pottery making. Others, also crudely modeled, were low

[6] A unilaterally barbed specimen from a pre-European Iroquoian village site in Eglinton division, Toronto, in the collection of E. J. Case of that city, is the only other harpoon point with a socket known to the writer.

[7] *Cf.* Wintemberg, 1906, Figs. 23, 26, 27, and 29.

[8] See Sagard, 1866, pp. 177, 179, 202, 259, 270, and 271, and Waugh, 1916, for information on the preparation of food among the Huron.

and bowl-like. Some of these were apparently flat-bottomed. Owing to the fact that others were in poor condition, and that they were represented by only a few parts, it was impossible to get an idea of the shape of the complete

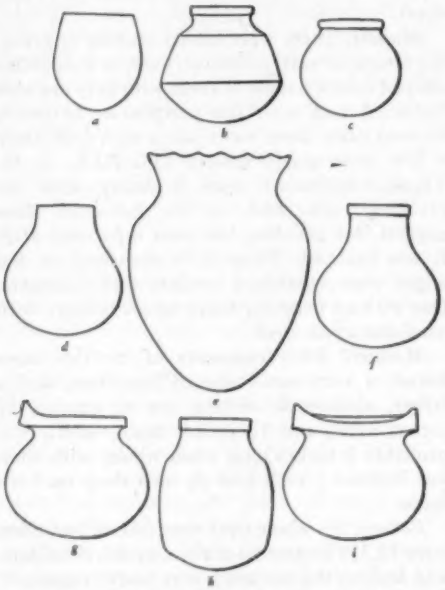


FIG. 14.—Outlines of pots from Sidey-Mackay site.

vessel. Nine pots appeared to have been pear-shaped, with a neck rising more or less vertically from the shoulders, and a mouth which was much smaller than the body (Fig. 14, *d*). Thirty-eight had flaring mouths, and these were in most cases, associated with ovoid bodies (Fig. 14, *e*). Most pots had overhanging cornice-like rims. Four with this kind of rim, and with high necks, seemed to be similar in type to that in Figure 14, *f*. Only a few even approached those from the Roebuck village site in elaborateness of shape (Fig. 14, *g* and *i*). Nineteen pots seemed to have had more or less straight sides (Pl. XX, *F*, 7, Fig. 14, *h*), in which respect they were like a small pot from York county in this Museum.[9]

One thousand one hundred twenty pots had overhanging collars; the rims of 493 others were merely thickened to form collars like those seen in cross section in Figure 15 *l*, *n*, *o*, *s*, *w*, *e'*—*i'*, *n'*, *o'*, *q'*, and *u'*.

Cross sections of rims were varied: 718 were like Figures 15 *e''* and *n'''*; 306, like Figure 15 *x*; 255, like Figure 15 *v''*; ninety-five, like Figure 15 *d'*, *o'*, and *q'*; seventy-three, like Figure 15 *k'*; forty-three, like Figure 15 *r''*; thirty-one, like Figure 15 *g''*; eighteen, like Figure 15 *a''*; sixteen, like Figure 15 *f*, except that the lip edge was squared instead of rounded; fifteen each, like Figure 15 *d* and *l''*; fourteen, like Figure 15 *n'*; twelve, like Figure 15 *h''*; nine, like Figure 15 *m'*; eight, like Figure 15 *f*; seven, like Figure 15 *a*; four each, like Figures 15 *j*, *w*, and *k''*; three each, like Figure 15 *e'* and *f'*; two, like Figure 15 *b''*; and one each, like Figure 15 *e*, *g*—*i*, *k*—*v*, *y*—*c'*, *i'*, *j'*, *l'*, *p'*, *r'*, *z'*, *c''*, *f''*, *i''*, *j''*, *m''*, *o''*—*q''*, *s''*—*u''*, and *w''*—*g'''*. A few rims were rolled (Fig. 15 *f*, *g*). The outside of the collars appeared to have been vertical in most cases; one sloped slightly outward. Height of collars varied between $\frac{3}{16}$ and $2\frac{1}{4}$ inches, that of the majority, between $\frac{1}{2}$ and $\frac{7}{8}$ inch.

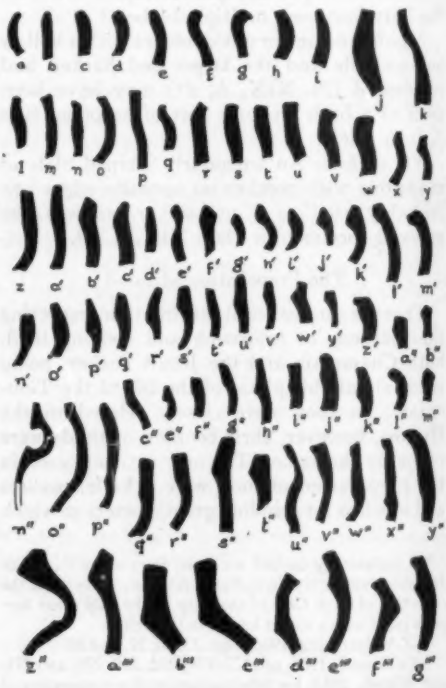
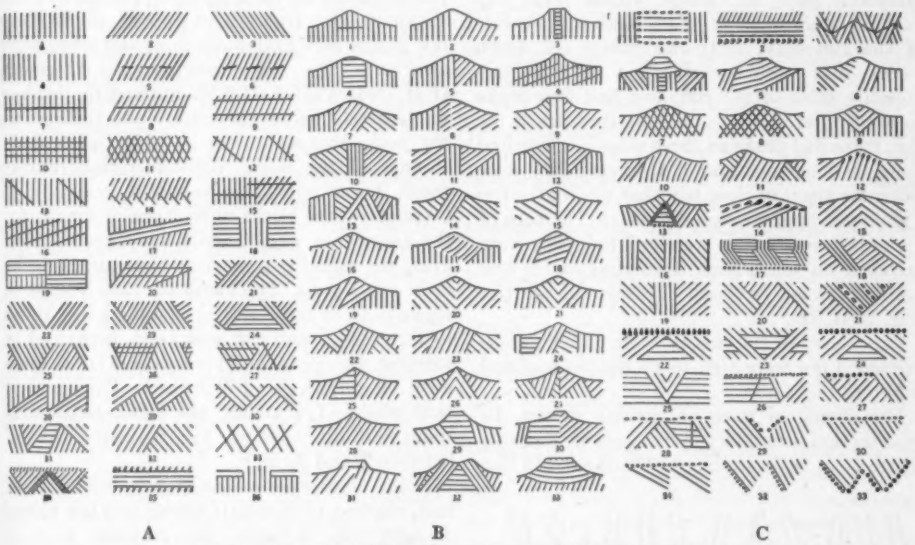


FIG. 15.—Cross sections of pot rims from Sidey-Mackay site (outside surface to left).

[9] See Smith, 1923, Pl. XLVII, Fig. 2.

One hundred sixty-one pots had angular or spout-like[10] lips (Pl. XX, D), but it was hard to say whether there was only a single spout, as in Figure 14 *g*, or two, as in *i*; in only five cases was it certain that there were spouts at each end. The fact that in most cases only a single spout of a kind was found would suggest there was only one spout on most of the pots. One pot had a double spout—that is, one alongside the other—apparently on only one side of the rim, a feature which occurs on other pots from others, giving a battlemented effect in some cases (Fig. 16, B, *3*, *9*, *31*, *33*). A roughly cylindrical projection about an inch high at the angle of the lip is unusual (Pl. XX, D, *4*). The peaks of fifty-four lips were notched (Pl. XX, E, *3*, and D, *3*, *7*, *12*); one (Pl. XX, D, *11*) had three notches.

The finish of edges of lips varied. They were flattened, as on the rims shown in the cross sections in Figure 15 *h*—*j*, on 1049 rims; rounded off on eighty-four (*a*—*d*); sloped to the



A B C

FIG. 16.—Decorative designs on pottery from Sidey-Mackay site.

Tionontati[11] and Huron[12] sites. Fifty-one lips had single vertical grooves on the angles (Pl. XX, D, *4*, *7*, *12*), which extended only part way up on two lips (Pl. XX, D, *1*, *3*); one had three grooves (Pl. XX, D, *11*). Tops of fifty-nine lips were rounded (Pl. XX, D, *5*) or pointed; they were flattened on twenty-seven outside on 154 (*w''* and *c'''*); and sloped to the inside on 455 (*r*, *v*, *b'* and *d'''*). The outer angle was beveled on two rims and rounded off on seven others. The inner angle of seven rims was beveled, and both outer and inner angles were beveled on two others (Fig. 15 *c'''*). A flange along the outer angle at the lip edge, (Fig. 15 *s'*), was found on thirty-seven sherds; on six others the flange was on the inner angle (Fig. 15 *l*), and on three a flange was found on both outer and inner angles (Fig. 15 *d'''*). In many cases the flanges resulted from pressure exerted during the making of the vertical and diagonal grooves on the outside and the decoration of edges of the lip.

Without reconstruction, it was impossible to get an idea of the shapes of the mouths of most pots. Two hundred twenty-two seem to have

[10] ED. NOTE. Mr. Wintemberg has used the terms "spout" and "spout-like" throughout to refer to that feature of the rims which is more commonly known as "castellation."

[11] One from a post-European site on Lot 12, Concession I, Collingwood Township, Grey County (Cat. No. VIII-F-17718*m*, National Museum of Canada).

[12] One from a site in Simcoe County in the Tache collection, and another from a pre-European site on Lot 5, Concession V, Bexley Township, Victoria County in the Provincial Museum collection, Royal Ontario Museum of Archaeology, Toronto.

had round mouths, though sixty-nine of these were doubtful; forty-eight, ovoid mouths, with a spout-like angular lip at the smaller end (Fig. 14, *g*); and a few others, oval mouths, with an angular lip at each end (Fig. 14 *i*). Only one seems to have been quadrangular, and, also, only one was octagonal; the latter, judging from this and other features, was perhaps brought from farther east in Ontario.

Rims were like those on pottery from other Iroquois sites in having peaked elevations on top of them (Pl. XX, C, *11*, D, *2*, and E, *1*). Nineteen pots (of which fifteen were uncertain) seem to have had a peak on one side of the rim only, forty-two others (of which twenty-four were uncertain), a peak on two opposite sides of the rim; one had two peaks close together, perhaps on opposite sides of the rim; three had peaks on three sides, and one had them on four sides; on 114 others, they were either far apart or close together, giving the top a scalloped appearance (Fig. 14 *e*). The tops of the peaks on 122 rims were pointed; they were flattened on ten others. Two rims had a low double peak on two opposite sides of the pot (Fig. 16 B, *32*).

Very few of the necks were deeply constricted; a few were high, as on the pot outlined in Figure 14 *f*.

The shoulders were of various shapes. In cross section, shoulders of 643 vessels resemble Figure 17 *a*; 167 were like *b*; 240 like *c*; 219 like

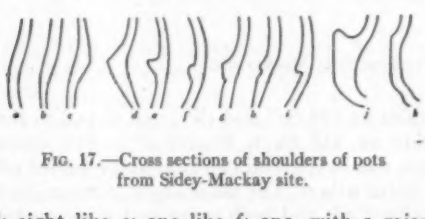


FIG. 17.—Cross sections of shoulders of pots from Sidey-Mackay site.

d; eight like *e*; one like *f*; one, with a raised flattened band, was like *g*; one was like *h*; four were like *i*; five, with pointed projections at the top, probably on opposite sides of the pots (Pl. XX, F, *5*, *6*, and *8*), were like the outline in *j*; and one was like *k*.[13] A few of the pots had sloping, flattened shoulders like the one in Figure 14, *b* (*cf.* Pl. XX, F, *4*).

Although none were intact, six pots had handles. In one case, the kind of handle was uncertain; in three it was curved and formed an extension of the pointed end of the lower angle of the lip; in two others it was straight, with the upper end welded to the lower side of the lip. A large scar on one shoulder fragment, where a handle had been broken off, showed two deep gashes punched with a pointed tool, evidently to make the junction of the handle and pot more secure (Cat. No. VIII-F-21109*b*).

The points of greatest thickness were usually the rim, shoulder, and base; the thinnest parts were the neck and bilge. Thickness of body pieces varied between $\frac{3}{32}$ and $\frac{5}{16}$ inch, but the majority were from $\frac{7}{32}$ to $\frac{7}{16}$ inch thick. Very few pieces were extremely thin, and there were also very few thick pieces. One fragment (Cat. No. VIII-F-21385), apparently broken immediately below the collar, was thickest at the neck, thinner at the shoulder, and much thinner at the bilge. Without reconstructing them, it was impossible to tell if vessels with extremely thin bilges were large or small, for the fragments were usually very small; however, we would expect such thin pieces to be from small pots. Thickness of walls varied in single pots; in some ridged shoulders like those in Figure 14, *c* and *e*, it was $\frac{3}{8}-\frac{7}{16}$ inch, and in another, $\frac{1}{32}-\frac{7}{16}$ inch. This was also true of two neck fragments, $\frac{7}{32}-\frac{3}{8}$ inch thick. Thickness of rims was $\frac{1}{8}-1\frac{1}{16}$ inches, the latter an angular spout-like lip, that of the majority ranged between $\frac{1}{4}$ and $\frac{7}{16}$ inch.

Color of exterior surfaces was red, tan, or buff, shading to chocolate brown in a few cases, or light gray to black. The majority were of various shades of red. Many pieces were a terra cotta red; this was especially true of most pieces tempered with fine grit. In many cases the color of inner and outer surfaces was the same, most commonly red, but also gray or black. Colors of outer and inner surfaces were not always the same; here again, the majority were red on the outside and gray or black on the inside. Comparatively few were gray on the outside and red or black on the inside, and only a few were black on the outside and red or gray on the inside. The surfaces of many pieces presented a mottled appearance. Dark gray or black interiors were probably due to prolonged use for cooking meats and other greasy foods, unless the colors were produced by some process intended to make the vessels waterproof.

Red paint on the outside of a few fragments

[13] Pots with similar pointed shoulders are rare (*Cf.* Harington, 1920, Pl. LXXXVIII, Fig. *b*, Pl. XCVII, Fig. *z*.

suggested that some pots had been painted. A few other pieces colored a magenta red on the inside may have been parts of pots used as containers for paint.

The surface finish of both outside and inside varied from smooth to granular—almost as rough as coarse sandpaper. Only a few were polished, and very few had a glazed appearance. Smooth pieces usually contained fine tempering material. Some pieces were uneven on the inside, especially at the junction of neck and shoulder, and of shoulder and bilge. Some pieces with rough surfaces were crazed; in a few cases, the cracks radiating from large pieces of grit tempering probably developed during firing, although they may also have been caused by frost during the long burial of the fragments.

Two thousand three hundred thirty-two rim sherds—all but twenty-eight of the total—103 necks, and 300 shoulders were decorated. So far as could be determined without reconstructing them, 1849 pots were decorated on the rim only; however, there is uncertainty concerning 377 of these; fifty-one were decorated on the lip edge only; two, one of which was uncertain, on the neck only; forty-seven, of which thirty-five were uncertain, on the rim and neck only; sixty-five, of which five were uncertain, on the rim and shoulder only (Pl. XX, C, *14*, and E, *3*); three, on the shoulder only; and five, one of which was doubtful, on rim, neck, and shoulder (Pl. XX, C, *2*). One thousand seventy-four rims were decorated on the outside only: 912, on the edge of the lip and the outside; eight, on the outside and inside; and only one, on the edge of the lip, outside, and inside. Fewer pots here were decorated on the inside edge than at the Uren, Lawson, and Roebuck village sites. One spout-like lip was decorated on the under side. The flat sides of pots of the type shown in Figure 14, *h* were usually elaborately decorated, the decorated zone on the one illustrated in Plate XX, F, *7*, being 5½ inches wide.

That many pots were used for culinary purposes was indicated by the carbonized incrustation of remains of food on the inside of numerous fragments. Even the outsides of a few pots were covered with a thick, blackened crust, in one case at least ⅛ inch thick. Large pots were probably used as storage vessels.

The pottery was made either of clay alone or of clay tempered with sand, grit, or crushed gneiss (of which feldspar was the constituent most used), mica, or shell; the majority contained grit tempering. On the broken surface of a split fragment was what appeared to be an impression of bark or grass; a charred sunflower seed in another had accidentally become mixed with the clay.

Grit tempering was of three grades: fine, $\frac{1}{32}-\frac{1}{16}$ inch in diameter; medium, $\frac{3}{32}-\frac{1}{8}$ inch; and coarse, $\frac{5}{32}-\frac{3}{16}$ inch, with a few particles up to ¼ inch. The various grades were determined visually rather than by breaking or pulverizing the pottery. Tempering was fine in about half the fragments; in about five-sixteenths of them it was medium, and in about three-sixteenths it was coarse.

Much fine tempering was sand, some of it possibly a crushed fine-grained sandstone. Even some pieces of medium thickness contained fine tempering. Medium tempering was seen in a few thick pieces and there were coarse particles in some thin pieces. Size of particles was not always uniform, some pieces with fine tempering having larger particles scattered through them. In a few cases, excess of medium tempering gave the appearance of coarseness. In most cases, about three-fourths of the paste consisted of clay and the rest of grit; in very few, the quantity of grit exceeded that of clay. In a few pieces, the coarser particles appeared to have worked to the centre in the course of malleating. In many cases, the coarse grit and mica tempering showed over all the outside surface. Five fragments contained shell tempering. The particles of shell varied from about $\frac{1}{32}$ to $\frac{3}{16}$ inch in diameter, the proportion of shell to clay being about one to four. A piece of shell in one fragment was about ¼ inch in diameter, but most of the pieces were smaller.

Very few pieces offered evidence of methods used in making pottery. A few narrow, roughly rectangular body fragments (one was about ½ inch wide) with two long, more or less parallel broken edges suggested that some pots were possibly made by coiling, but none showed the concave and convex edges characteristic of most broken coiled ware. Parallel cracks on the outside of one large fragment were indicative either of poorly welded coils or of a failure to obscure the junction of the coils by smoothing. On one edge of a shoulder fragment there was what appeared to be a lap weld.

The surfaces of some fragments suggested that the clay had been poorly malleated, and

there were flaws on the surfaces of others. Although the outside of one fragment had a corrugated appearance, none of the other pieces showed the wide and deep scarifications seen on the outside of much of the pottery from the Uren village site.[14] The outer surfaces of many pieces, especially from the necks of vessels, and the inner surfaces of others showed marks of scraping. The crumbly or roughened streaks and patches on the exterior surfaces of some fragments suggested that they had been scratched when the paste was partly hardened. The outer surface of one piece had been rubbed with a bunch of coarse grass. Markings left by malleating paddles were seen on very few pieces; linear marks on some pieces seemed to have been accidentally caused by the corners of a paddle. One fragment showed cord roughening, and a few others showed marks that apparently were left by a rough-surfaced paddle. There was no checkered marking like that at the Uren and Roebuck village sites.[15] Some pieces had rippled or, in a few cases, what might be called pebbled surfaces. It was uncertain what kinds of paddles were used to produce these effects; possibly they were not made with a paddle at all.

Decorative techniques employed by potters at the Sidey-Mackay site were modeling, luting, punching, notching, impressing, stamping, trailing, and incising. In some cases, the shapes of impressions and marks suggested the tools used in producing them.

Modeling to produce decorative effects was confined chiefly to ornamental shaping of some rims, especially the spout-like lips and shoulders; a few of the latter showed raised ornamental bands, ridges, and projecting points.

Only two pieces were decorated by luting.

Large pits formed by punching, probably with the blunt end of an antler tine, occurred on a few pieces.

Notching seemed to have been done by pressing a sharp-edged, triangular or squared stick either straight across the edges (Pl. XX, C, *1*) or on the outer (Pl. XX, A, *2* and *3*) and lower angles of the collars. Rounded notches on the projecting edges of five rims (e.g., Pl. XX, B, *3*) were probably formed by pressing a bone or antler tool with a circular or oval cross section deeply into the clay. What may be called notches on the lower angles of four collars (Pl. XX, C, *10*, *14*, and E, *1*) were formed by pinching the clay between thumb and forefinger; decoration of this kind was especially common at the Roebuck village site.

Two thousand seven hundred thirty-seven pieces, the majority of which were rim fragments, were decorated with trailed lines. In a few cases, even the edges of lips bore this kind of decoration. The width of the line depended on the kind of marker used, the depth, on the amount of pressure exerted. In many cases, lines were fairly evenly made, but most of them were poorly executed as compared with those on pottery from other Iroquoian sites. In some cases the lines were made when the paste was partly dry, occasionally leaving the edges in a ragged condition. Some lines, especially on the shoulder, terminated at each end in deep oval, lenticular, or squared depressions, suggesting that there the markers had been purposely pressed more deeply into the clay. Some vertical and diagonal lines or grooves on rims were deeper at the lower end than at the top, indicating that they were commenced by pressing the marker lightly into the clay and ended by pressing it heavily. In other cases, the lines commenced with a deep impression at the top and decreased in width toward the bottom (Pl. XXII, B, *13*, 17). Some lines were curved, but they do not seem to have been made so intentionally.

Certain patterns, a few complex, were composed of wide deep grooves, some of which were crude and apparently were made with the rounded tip of an antler tine.

Ornamentation by incision was less common than that produced by trailing; only fourteen fragments had this kind of decoration.

Various impressed decorative effects were produced by either special or improvised tools. Twenty-four pieces, including one fragment of a neck and six fragments of shoulders, were decorated by pressing the finger nails—in one case the thumb nail—into the clay; one showed this kind of marking on the inside. Nine hundred eighty-eight pieces had other kinds of impressions, but in only a few cases was it possible to identify the nature of the tool used to produce them. Eighteen pieces bore what looked like roulette markings, but they did not seem to have been produced with a rocking stamp.

A rough-ended stick appeared to have been used to produce a row of roughly oval depres-

[14] Wintemberg, 1928, Pl. II, Figs. 1–3.

[15] *Idem.*, 1928, Pl. II, Fig. 6, and Pl. XVI; 1936, Pl. II, Fig. 1.

sions on a shoulder fragment (Cat. No. VIII-F-20235*p*). A tool with a conoid tip—perhaps a deer antler tine—could be made to produce either half-round, circular, oval, or ovoid depressions by holding the tool at different angles when pressing it into the clay; resulting depressions would be circular if the tool were held at right angles to the surface, and either half-round, oval, or ovoid if held at other angles. Tools with lenticular cross sections could have been used to produce lenticular depressions of various sizes. Some such depressions, however, seemed to have been drawn into the clay; to judge from their shape, bone awls were used in forming them. One pot was decorated by pressing cords into the clay (Pl. XX, A, *12*).

Stamping occurred on five pots; three of them, decorated with circular stamps, may have been brought from Iroquoian sites farther east.

The relative quantity of well-fired pieces seemed even greater than at the Roebuck village site. Those with fine tempering were better fired than those with medium or coarse tempering. The extent or thoroughness of firing could be determined by examining edges of fragments, thinner pieces in most cases being more thoroughly fired than thicker pieces, as was to be expected. The mottled appearance of the surface of many pieces indicated unevenness of firing. On the inside of one fragment (Cat. No. VIII-F-20257*c*) were irregular cracks that did not extend to the outside; these apparently developed during firing. The color of the majority of fragments of well-fired pots was uniform; it was either red, gray, or black clear through and was usually the same as that of the outside and inside surfaces. The next largest number of fragments were of two colors; an inner layer was usually darker than that next the outer surface; the dark layer lay next the outer surface in only a few fragments. In a few pieces, the lighter part consisted of a mere shell on the outside. The majority of fragments $\frac{5}{16}$–$\frac{1}{2}$ inch thick, many containing coarse grit temper, had a dark central core; a few thin pieces and a few shoulder fragments of the kind outlined in Fig. 14 *c*, also had such cores. Occasionally, the inner layer or core was red instead of black. In a few fragments, the core was about half the thickness of the sherd; in another it was about $\frac{9}{32}$ inch thick, whereas the layers next to the outer and inner surfaces were $\frac{1}{32}$ and $\frac{1}{16}$ inch thick, respectively.

Hardness of about 7500 rim and body fragments was ascertained by the method recommended by March.[16] That of 5860 fragments was 2.5; that of 1156 was 3; 248 had a hardness of 3.5; 171, 4; forty-seven, 4.5; only four were harder than 4.5. Eighty-six fragments had a hardness of 2, but most of these had recognizably soft outer surfaces, and a few others were shell tempered. Not all of these soft-looking pieces were actually soft, however, a few being as hard as 3 and 3.5. Some of the pieces with a glazed appearance were harder than those that were merely smoothed. Pieces of terra cotta red were harder than some of the other red pieces (3 and 3.5). Most thin pieces were harder than many thick pieces. Some pieces with a hard surface were found to be otherwise quite friable. Pieces with excess mica tempering, although fairly hard on the surface, were very friable and could be picked to pieces with the fingers.

Holes drilled near broken edges were for fastening cracked pots together with sinew or cord. Most of the holes were conical and were drilled from the outside; the sides of only one hole were straight and parallel.

TOOLS USED BY MEN

Men were probably the workers in wood, bone, and stone; their tools consisted of stone adzes, ungrooved stone axes, chipping or flaking tools, hammerstones, chisels and knives made of teeth, and whetstones or grinding stones. Among the collections there are no antler tine wedges or chisels with ground tips similar to specimens found in most other Iroquoian sites, nor any knives made from bear canines, like those from sites in Victoria County, Ontario,[17] and from the Roebuck village site.[18]

Stone adzes. Fifty-three stone adzes were of the kind usually found in other Iroquoian sites. Eight were complete; the rest were either fragments from lip or poll or specimens with lip or poll, or both poll and lip, damaged. On several examples, the cutting edge was the only part completed; only a few were smoothed on all sides. Only one was well finished (Pl. XIX, B, *3*). Cutting edges, intact on most unbroken specimens, were mostly convex; they slanted to one side on a few others. As a rule,

[16] March, 1934, p. 20.
[17] See Boyle, 1904, Figs. 6–8.
[18] See Wintemberg, 1936, Pl. XIV, Figs. 2, 3.

the poll was rough, even on some specimens that appeared completed. One specimen had incurved sides. In cross section they were either oblong, oval, or nearly circular. The smallest whole specimen was 1 1/8 inches long, 1 inch wide, and 3/4 inch thick; the largest was 5 inches long, 1 3/8 inches wide, and 1 1/8 thick. A few others were probably larger, judging from the size of fragments. One specimen, unusually short in relation to its width, was roughly rectangular in cross section.

Ten pieces of rock were in process of manufacture into adzes (Pl. XIX, B, *1*), but the cutting edge of none had been ground.

Ungrooved stone axes. Five specimens, only one of which was complete and four of which were bilaterally symmetrical as viewed from the narrow sides, may have been ungrooved axes; some with one face more rounded than the other, however, may have been adzes. The complete one, 4 3/8 inches long, 1 inch wide, and 1 1/8 inches thick, had been accidentally broken lengthwise and the broken surfaces were refashioned but not smoothed (Pl. XIX, B, *2*). One fragment was part of a specimen which had both faces and the sides smoothed.

Chipping tools or flakers. The rounded or conoid ends of seven antler tools (Pl. XIX, C, *1*) were scarred by use as chipping tools. At the upper end, which was larger and flatter than the lower in two specimens, the cells of the antler were closely impacted by blows of a mallet or hammer. The sides of the upper end of one were slivered. The shortest specimen was 2 1/2 inches and the longest 3 1/2 inches long, and the diameters varied from 3/4 × 1/4 inch to 5/8 × 1/2 inch; one was 1/4 inch thick at one end and 1/2 inch at the other.

Hammerstones. Both plain and pitted hammerstones were found. The edges of seven plain specimens, three of which were derived from waterworn pebbles, were more or less battered from use. Two nearly spherical and two oval ones were battered at one end (Pl. XIX, B, *7*). Six were faceted (Pl. XIX, B, *4*) as in hammers from other Iroquoian sites. One, consisting of the poll of a broken adz or ungrooved ax, was considerably battered from use. There were nine pitted hammers, mostly of a size conveniently held in the hand, made from oval or irregularly shaped pebbles, with both sides pitted (Pl. XIX, B, *6*). The periphery and, in a few cases, the sides had been battered.

Anvils. A sandstone slab, irregular in outline, with deep, irregular pits on both flat faces was probably used as an anvil on which stones were broken or on which incipient forms in process of manufacture into adzes were roughed out. A similar slab of sandstone, classed as a muller, with deep jagged pits on one side, probably was used for the same purpose.

Tools made from teeth. Three polished lower incisors of the beaver were probably used as chisels without modification other than breaking off the root. Another incisor which may also have been used as a chisel had been shaped by breaking off part of the inner, flat side near the cutting edge and grinding the slanting end.

Seventeen lower incisors of the beaver were split in half lengthwise and showed signs of wear on the broken edges of the concave side, probably from use as knives. Eight were roughly triangular in cross section and showed wear on both broken surfaces.

The lingual aspect of one lower incisor and sixteen upper incisors of the beaver, two lower incisors of the porcupine, and two incisors (one upper and one lower) of the woodchuck had been ground flat, in some cases to such an extent that the teeth were reduced to less than half their original thickness, exposing the neural cavity in those of the younger animals. Three other beaver incisors were split in half lengthwise before they were ground; all showed evidence of use on the concave part of the tooth.

Points for drills. A chert flake, crudely chipped to a point, was used as a drill, if one may judge from the worn tip (Pl. XIX, C, *7*); a broken long, slender, chipped piece, appeared to have been in process of reshaping manufacture.

Whetstones or grinding stones. Twenty-three whetstones, usually with roughly uneven or broken edges, were of sandstone, and one was of limestone; in a few cases they were made of pebbles. One had both faces smoothed from use, but none was deeply hollowed. One broken to a somewhat trapezoidal shape, had both faces and two edges smoothed, and, in addition, one of the edges was grooved lengthwise as if from use in sharpening bone or other objects. They varied in size and thickness; the largest, somewhat quadrangular, was 5 1/2 × 7 1/2 inches in diameter and about 1 1/8 inches thick.

TOOLS USED BY WOMEN

The tools used by women in some of their many activities such as pottery making, tan-

ning, and textile work, consisted of scrapers of shell, stone, and bone; bone awls; and bone needles.

Shell scrapers and smoothers. Seventeen valves of freshwater clams (*Elliptio complanatus* and *E. dilatatus*), all worn on the ventral edge (Pl. XIX, C, *9*) and two worn on the back, were probably used to form pottery. On eight other shells of the same species the sides and, in a few cases, the umbones were worn down, perhaps from smoothing the interiors of pottery vessels.

End scrapers. Forty-seven scraper blades, one chipped from limestone and the rest from chert, were probably used in dressing hides (Pl. XIX, C, *10–14*). A few seemed to be unfinished. The majority retained the original fractured surface on the lower face. Twenty-one were plano-convex, twenty-one concavo-convex (one extremely so), and three roughly double convex, with the tip more convex than the lower face. Thirty-two specimens were crude (Pl. XIX, C, *13*); nine were oval (*12*); and eighteen, one of them almost pointed at the small end, were like those in *10* and *14*. The upper ends of two specimens, including the one in *11*, were neatly trimmed to a wedge shape to facilitate insertion in the cleft ends of the handles. They ranged in length from $1\frac{3}{16}$ to $2\frac{1}{16}$ inches, in width from $\frac{1}{2}$ to $1\frac{3}{16}$ inches, and in thickness from $\frac{1}{8}$ to $\frac{1}{2}$ inch. On many, either the scraping edge, only, was finished or the edges and part of the sides were neatly trimmed or chipped; a few others were trimmed all round. Two were ridged almost from end to end. Only a few showed signs of wear on the edge from use, but a few were polished on both faces.

Bone flesher. The fragment of a highly polished implement with a fairly sharp edge, of the same type as those used until quite recently by Plains Indians in dressing hides, (Pl. XIX, C, *8*) appeared to have been made from the metatarsus of a wapiti. A fragment of what seemed to have been a similar tool, split lengthwise and refashioned into an awl, had a very convex scraping edge. Whole specimens of the same kind of tool were found some years ago in a post-European Tionontati site about one mile to the northeast of the Sidey-Mackay site,[19] on what seems to have been a pre-European site about four miles farther east,[20] and in pre-European Huron sites in other parts of Simcoe county[21] and in Victoria county.[22]

Bone awls. The number of bone awls was very small, as compared with the abundance of these tools at other Iroquoian sites, notably the Roebuck village site; 107 specimens were found, some of them illustrated in Plate XIX, C, *16–23*. Nearly half were broken; either the bases or the tips, and sometimes both, were missing, They were made of the usual bones of deer and other mammals, and a few were of bird bones; the majority were of deer bone. A few were made of splint bones of deer. Of those shown in Plate XIX, C, one was made from a metacarpal of a dog (*21*); one long one (*19*) from a fibula and a larger one from an ulna of the bear; and one from a human ulna (*22*). Two were of antler. Most of the awls retained the marrow hollows of the bones from which they were made, and about a third retained part or all of the joint at one end; in some cases it served as a handle. Only four specimens were smoothly finished and the joints and marrow hollows completely obliterated. Some were crude (Pl. XIX, C, *20*). A few were long and slender (Pl. XIX, C, *18*, *23*). The one shown in Plate XIX, C, *17* was well finished, although it retained part of the marrow hollow. A few were decorated with incised transverse and diagonal lines (Pl. XIX, C, *16*). The length of the shortest complete specimen was $1\frac{3}{4}$ inches, that of the longest, $9\frac{1}{8}$ inches; the diameter ranged between $\frac{5}{32}$ and 1 inch.

Perforated bone netting needles. Of twelve bone netting needles, only two were complete; the rest were either broken at the hole or were tip fragments. Most appeared to have been made

[19] On the Andrew Melville farm, Lot 10, Concession V, Nottawasaga Township. One of them in the Provincial Museum collection, Royal Ontario Museum of Archaeology, Toronto (Cat. No. 8073) was described and illustrated by Boyle, 1889*b*, p. 33 and Fig. 22.

[20] On the Thomas White farm, Lot 12, Concession I, Nottawasaga Township (Cat. No. 6068, Provincial Museum collection, Royal Ontario Museum of Archaeology). See Boyle, 1889*b*, pp. 32–33 and Fig. 21.

[21] One on the Daniel Quinlan farm, Lot 21, Concession III, Vespra Township (Cat. No. 16921, Provincial Museum collection, Royal Ontario Museum of Archaeology). See Boyle, 1903, pp. 27–29, and Fig. 8. Another made from the left femur of a deer, from a site elsewhere in the county, is in the Tache collection, Laval University, Quebec.

[22] One, with the scraping edge toothed as in most of the Plains Indian specimens, is from a site on Lot 1, North Portage road, Bexley Township (Cat. No. 19257, Provincial Museum collection, Royal Ontario Museum of Archaeology). See Boyle, 1891, Fig. 131. Another specimen (Cat. No. 22980, Provincial Museum collection, Royal Ontario Museum of Archaeology) is from Lot 12, Concession I, Fenelon Township.

from the outer wall of animal ribs; some were hollow on one face. Most were curved from end to end and were widest at the middle. Some were highly polished. Ends of the complete ones were rounded. The length of the shortest specimen was 3 1/16 inches, of the longest, 4 1/2 inches. Width varied from 1/4 to 5/16 inch; thickness, from 1/16 to 3/32 inch. A few of the holes were oval; one was almost lenticular and about 5/16 inch long by 3/32 inch wide (Pl. XIX, C, *15*). In three, the holes were near the middle, and, in two, they were nearer one end. A few of the holes showed signs of wear on the edges. Three other specimens, including a complete one with a perforation, appeared to be unfinished, as both faces and sides had not been rubbed into shape.

DRESS AND ADORNMENT

No articles of dress, but many objects used in personal adornment, including pendants, beads, and an armlet, were found. Like their Huron kindred of the French mission period, the people probably dressed in the skins of beasts. The Tionontati are known to have practiced tattooing,[23] but none of the modeled human faces from the Sidney-Mackay site bore markings to suggest that the inhabitants practiced this kind of embellishment.

Articles of Personal Adornment

Beads. Beads were made of stone, shell, bone, teeth, earthenware, and pieces of broken pipe stem.

All but one of the forty-three discoidal stone beads which were secured were complete. Of these, about three-fourths were of sandstone, while the rest were of shale or limestone, except for one, each, of slate and soapstone. The majority were more or less circular (Pl. XIX, D, *11*), although some were of an irregular shape and one was hexagonal. They varied in diameter from 5/16 to 1 1/4 inches, and in thickness from 3/32 to 3/8 inch. For the most part, their peripheries were straight. In many cases the faces were not smoothed. The soapstone bead (Pl. XIX, D, *10*) was thicker on one side than on the other and was highly polished. Holes were straight, conical, or biconical, most of them biconical; one was 1/16 inch in diameter. They were not in the center of the bead in most cases.

Sixty-six other specimens, mostly of sandstone, were in process of manufacture into flat beads. Of these, nineteen discoidals were more or less circular in outline; the shape of forty-five, including an angular one and two that were slightly oval, was irregular. Edges of most were smoothed, in some cases only partly so. Faces of a large proportion were smoothed, but none was polished. Perforations had not been commenced on forty specimens; on six, the hole had been commenced on one face, and on fourteen others, on both faces. Holes were completed in nine specimens, but the peripheries of five perforated ones had been left in a rough, chipped condition. They were from 3/8 to 1 5/16 inches in diameter and from 1/16 to 7/16 inch thick. The perforated piece of slate shown in Plate XIX, D, *34*, and the one shown in *26*, were evidently in process of manufacture into beads; the latter was not of the discoidal variety.

Shell beads were of three different kinds (Pl. XXI, D, *13–19, 22*). The first and simplest kind consisted of whole shells of freshwater snails, with holes for stringing them broken through the lip. These included twenty-one shells of *Campeloma decisum* (*17*), eighteen of *Goniobasis livescens* (*16*), and three of *Pleurocera acutum*. In one shell of a marine mollusk, *Marginella apicina* (*15*), the hole was produced by grinding off one side of the spire. The second kind was discoidal. Two, 1 1/32 and 5/16 inch in diameter, respectively, with a 3/16-inch hole in the middle and straight peripheries (*14*), were derived from columellae of large marine univalves. Six others, of which one was circular, two were oval, and three were of an irregular shape, were made from pieces of freshwater clam shells and were 7/16–3/4 inch in diameter by 1/32–3/32 inch thick. One (*13*) had both faces flattened and polished, and three retained the dark epidermis of the shell on one face. All but one were perforated; in only one case was the hole in the center. Holes in three beads were straight; they were biconical in two and conical in one. One was imperforate and unfinished (*22*). The third kind, of which there were six specimens, including a fragment, consisted of long, roughly cylindrical beads (*18* and *19*) derived from columellae of conchs. In cross section, one was almost circular and five were oval. They varied in length from 7/16 to 1 1/8 inch, and in diameter from 5/16 to 7/16 inch. They were polished, the ends mostly rounded, and some retained part of the spiral groove of the columellae.

[23] See Thwaites, 1896–1901, Vol. I, p. 279.

There were ninety hollow bone beads (Pl. XIX, D, *24, 27–31, 38*), including twenty-five fragmentary ones. About two-thirds were of bird bones (*27–30*) and the rest, of mammal bones, including those of the aboriginal dog (*24, 31*). Length varied from $\frac{5}{16}$ to $2\frac{3}{4}$ inches; diameter, from $\frac{3}{16}$ to $\frac{1}{16}$ inch. Some were polished on the sides, and the ends of most were smoothed and polished, although in some cases they were uneven. Rough ends suggested that others were unfinished. One had been scorched to a gray color and two parallel, narrow, longitudinal faces had been ground on one side. Another, highly polished, had been purposely blackened by scorching. One was scored around the middle, perhaps to facilitate breaking into two shorter beads. One had three short, transverse incisions on one side, perhaps intended for ornament. The large one shown in Plate XIX, D, *38* had a row of six deep, wide incisions on one side and four on the other.

Three beads (one of them, unfinished, $\frac{1}{2}$ inch long, $\frac{5}{8}$ inch wide, and $\frac{3}{8}$ inch thick) were made by removing the roots and crowns of canine teeth, two of the wapiti and one of the dog, and grinding the cut ends smooth, in two of them until the neural cavity was exposed. Through this, the string was passed (Pl. XIX, D, *20, 21*).

There was a single earthenware discoidal bead, $\frac{9}{16}$ inch in diameter and $\frac{3}{16}$ inch thick, convex on one face and flat on the other, with rounded edges and a parallel-sided straight hole in the center (Pl. XIX, D, *12*).

Part of the stems of two broken earthenware pipes, with fractured ends ground smooth, probably were beads (Pl. XIX, D, *25*). One of them was almond-shaped in cross section, with a row of notches on the sharper angle.

Pendants. There were several pendants (Pl. XIX, D, *1–7*). The grooved stone object (*7*) was probably one. Two deer incisors (*1*) and a canine of a wapiti (*2*) were notched for suspension. Other pendants consisted of a small pebble, $\frac{5}{16}$ inch thick, with the hole broken out; two perforated canines of bears (*5*); three of dogs (*4*), one with the hole broken out; and two of wapiti (*3*), both with the root end ground down. A bear molar with the root perforated (*6*), was the only one ever found by the writer in an Iroquoian site.[24] Three incisors of deer were also perforated; one was grooved after the hole was broken.

Other ornaments. A fragment of a clam shell with the umbo ground flat, exposing the pearly part of the shell, had a small conical hole drilled through the side, perhaps for suspension as an ornament. A fragment of an object which was probably an ornament was made from the columella of a large ocean shell $1\frac{1}{2}$ inches long, $\frac{5}{16}$ inch wide, and $\frac{5}{32}$ inch thick, flattened on one face and rounded on the other. One end was somewhat chisel-shaped and the perforated end was broken off (Pl. XIX, D, *8*).

There were also three pieces of the anterior part of the shells of freshwater clams with all edges worn off round and in one case polished, but none was perforated (Pl. XIX, D, *23*); they were probably unfinished ornaments.

Armlet. There was a fragment of an armlet made of antler (Pl. XIX, D, *9*), $\frac{1}{16}$ inch thick, with all except one edge broken. It was probably very wide. The hole, which was made by gouging from both faces, was small and irregularly shaped.

A fragment of a thin, wide piece, either of a wapiti rib or of antler, was possibly in process of manufacture into an armlet.

GAMES AND AMUSEMENTS

A small, round pebble (Cat. No. VIII-F-17563), $\frac{13}{16}$ inch in diameter and $\frac{5}{8}$ inch thick, and a nearly spherical nodule of clay, $\frac{11}{16} \times \frac{9}{16}$ inch in diameter (Pl. XIX, D, *40*), were possibly used in games.

Three disks of sandstone, three made from potsherds, one of modeled earthenware were more likely to have been used in games. The sandstone disks (Pl. XIX, D, *36*) were roughly circular, with only parts of the edges, and in two cases both faces, smoothed. Some may have been in process of manufacture into beads like the one shown in *11* of the same plate. The potsherd disks were like those from the Roebuck village site; two were derived from plain pieces with parts of the edges smoothed, and one (Pl. XIX, D, *37*) was made from a decorated shoulder fragment, with the edges more or less smooth. The modeled earthenware disk, which was crudely circular with rough faces and edges, had a deep pit in the middle of one face (Cat. No. VIII-F-20525).

Two broken proximal phalanges of the deer, each of which had a hole through the distal articular facet, probably served as units for

[24] Similarly perforated molars are rarely found in Iroquoian sites elsewhere. See Parker, 1922, Pt. 1, Pl. 36, Fig. 7 (two at left).

cup-and-pin games. They were like others from Iroquoian sites elsewhere in Ontario. An apparently unfinished specimen had a deep V-shaped groove cut into the distal facet to form a hole, but the rest of the bone was unworked. One, made from the proximal phalanx of the wapiti, with a hole through the distal end and the proximal end hollowed to the same diameter as the marrow hollow, was probably intended for a game unit also, unless it was used as a pipe, as suggested below.

Of eleven flattened proximal phalanges of the deer and wapiti, two were unfinished. Usually the front and back of the bone were flattened from end to end, exposing the marrow cavity, in one case for its full length (Pl. XIX, D, *33*). On three, both ends of the front had been ground down at a slant (Pl. XIX, D, *32*) exposing the marrow cavity at each end. On an apparently unfinished one, only the proximal end had been ground. A hole was bored through the distal articular facet of one; on two it was bored through the back near the distal end. Three irregularly burnt markings occurred on the distal part of the one shown in Plate XIX, D, *32*, and both edges of the large opening at the proximal end were notched; there was a faint transverse mark on the front of the distal half on another specimen. One was deeply hollowed on both edges of the frontal opening The method of manufacture of these objects was like that at the Roebuck village site.

OBJECTS OF SUPERSTITION AND RELIGION

There were no objects that must certainly have been used in religious ceremonials, and no objects, except perforated and notched teeth, that could have been amulets.

Masks. That the people of this site may have used masks in their ceremonies was suggested by the mask-like appearance of some of the human faces modeled on earthenware pipes (Pl. XX, I, *17–19*).

Rattles. A fragment of a carapace and one of a plastron, with a hole bored in each, apparently of two different species of turtle, were probably parts of rattles used in religious ceremonies. The edge of one of the pieces was polished.

SMOKING

The Tionontati raised considerable quantities of tobacco,[25] which they traded with other Indian tribes,[26] and for this reason they were commonly known as the Tobacco Nation (the French *Nation du Petun*). The large number of pipes found in the Sidey-Mackay site, although only about half that in the collection from the Roebuck village site in eastern Ontario, suggested that besides trading tobacco for other commodities, the inhabitants themselves smoked a good deal of what they raised.

Pipes were made of stone and earthenware, and two bone objects also looked as if they had been used for smoking.

Stone pipes. There were fourteen finished and nine unfinished stone pipes (mostly fragmentary), the majority of which were of the stemless or detached type (Pl. XX, G, *1–6*); only a few were monolithic stemmed forms.

The small, detachable, limestone specimen (*4*) with a conical bowl cavity about $\frac{7}{8}$ inch deep and $\frac{1}{2}$ inch wide at the mouth and a conical stem hole $\frac{11}{32}$ inch in diameter, was the smallest stone pipe found. One (*3*), also simple, was made from the elbow portion of a broken, stemmed limestone pipe by smoothing both fractured ends and hollowing out the larger end into a conical cavity about $1\frac{1}{4}$ inches deep and $\frac{3}{4}$ inch in diameter at the mouth. The hole for the reception of a separate wooden stem, also conical, and $\frac{5}{16}$ inch in diameter, was drilled into what was the bottom part of the stem. Four fragments (Cat. No. VIII-F-20695*a–d*) seemed to have been parts of two, or possibly three, limestone pipes of the detachable, high-bowled type, rectangular in lateral cross-section, similar to one found in a Neutral site in Oxford county.[27] The sides of both were smoothed and polished, and the angles at the top were decorated with small, shallow notches; larger notches on part of the second fragment suggested that all the longer angles of the bowl had been notched. The bowl cavity of the most complete one, which showed drill striae, was $1\frac{7}{8}$ inches deep and probably $\frac{3}{4}$ inch wide at the mouth. A fragment of a vasiform limestone pipe (Pl. XX, G, *6*) differed from others of the same type found at post-European sites elsewhere in Ontario, in being decorated with an encircling groove near the edges of the lip and a row of round pits on the lower part of the constricted portion of the bowl. Part of the surface was polished. The conical stem hole was about $\frac{7}{16}$

[25] Thwaites, 1896–1901, Vol. XX, p. 43.

[26] Champlain, 1922–1932, Vol. VI, p. 248.

[27] See Boyle, 1898*b*, Figs. 5–8.

inch in diameter and was at right angles to the bowl cavity, which was 1½ inches deep, about ⅜ inch in diameter at the mouth, and about ¼ inch across at its junction with the stem hole. The sides of the bowl cavity showed the striae left by the drill, but the stem hole was smoothed. Hitherto all pipes of this type observed by the writer have been from post-European sites.

A limestone pipe of unique form (Pl. XX, G, *5*), somewhat square in cross section, had the top flattened, the base rounded, and some of the sides slightly convex. The depth of the bowl cavity was ¾ inch, the diameter at the mouth, ⅝ inch; the conical hole for the stem was ¼ inch in diameter. A circle was crudely cut around the hole. All sides of the top were decorated by notching the angles, V-shaped figures were cut into the sides near the top, and a headless human form was incised on the side to the right of the stem hole (see under "Decorative Art"). A nearly similar limestone pipe, but without the groove around the top, was stolen soon after it was found. One of two other detachable bowls, skilfully carved from black stone to represent a mammal, with a head like those on other effigy pipes,[28] was also stolen. The second (*9*) was a fragment of a bird effigy pipe carved from coarse, friable sandstone. It retained part of the bowl cavity and the stem hole, which entered the bowl through the back.

Two fragments, one, a part of a stem and the other, an elbow, were from stemmed stone pipes. Besides those described above, four fragments of bowls were parts of either detachable or monolithic stemmed pipes. One, a fragment of a steatite bowl, seemed to have had a row of round depressions around the top; the top of a highly-polished fragment which may have been a cylindrical bowl, of the same material, was decorated by a row of widely separated, alternating oval and lenticular depressions (Cat. No. VIII-F-20543*g*). The carved human face shown in Plate XX, G, *7* was part of either a detachable or a stemmed pipe, probably the latter.

In addition to the finished specimens, there were nine pieces of stone in process of manufacture into pipes, all but one of the detachable type (Pl. XX, G, *1*, *2*). A few were blocked into shape. Others showed pecking on the angles, and others still, both pecking and grinding. The one in Plate XX, G, *1*, 1½×1⅜ inches in diameter at one end and $\frac{7}{16}\times\frac{23}{32}$ inch at the other, was evidently in process of manufacture into a bowl of nearly the same shape as the one in *5* of the same plate. The sides and the larger end were flattened, but not polished; the smaller end had been rounded from side to side. The drilling of the bowl cavity was commenced in the larger end. One unfinished specimen (Cat. No. VIII-F-20810*a*) was evidently in process of transformation into a vasiform bowl of the same kind as the one in Plate XX, G, *6*, but perhaps with the bowl more or less square. Parts had been smoothed, and the part below the lip pecked to form the constricted part of the bowl. The sides of the bowl cavity showed drill striae. The unfinished specimen in Plate XIX, B, *5* probably was also in process of manufacture into a pipe. Four pieces, including the one with the head missing (Pl. XX, G, *2*), were apparently unfinished bird and mammal effigy pipes; the large hump at the bottom of the one illustrated was a conventionalized representation of feet, as on most bird effigy pipes.[29]

Earthenware pipes. Although no whole specimens were found, this class of pipes was represented by four hundred fragments, including nineteen secured in 1923. More than half were stems, from many of which the mouthpiece was missing; very few bowls were whole.

There were no pipes with massive cone-shaped bowls like some from Neutral sites,[30] no highly elaborated bowls like two from the Roebuck village site[31] and two from the site of Hochelaga,[32] and no human effigy pipes of the "blowing face" type[33] which occur in most post-European Tionontati, Huron, and Iroquois sites. None, also, was of the kind in which the open mouth[34] or one of the eyes[35] of a human face served as bowl cavity, as in two pipes from another Tionontati site.

Most bowls were well modeled and surfaces of most were smoothed, in some cases polished. The majority were of a reddish color, in one case mottled with a brighter red; a few were gray; one was brown; and a few others were black, this being the color of most pipes from

[28] Cf. Laidlaw, 1903, Fig. 22, but it had a shorter muzzle.

[29] *Cf.* Laidlaw, 1903, Figs. 27, 28, 32, 33, 35.

[30] See Wintemberg, 1931, Pl. XIII, Fig. 3.

[31] *Idem*, 1936, Pl. XVI, Figs. 14, 15.

[32] See Dawson, 1888, Figs. 23, 23*a*.

[33] See Wintemberg, 1931, Pl. XIII, Fig. 15.

[34] See Boyle, 1889*a*, Fig. 13; 1905, Fig. 21; also Smith, 1923, Pl. LXIX, Fig. 7.

[35] See Boyle, 1891, Fig. 76; Smith, 1923, Pl. LXIX, Fig. 8.

post-European Tionontati, Huron, and Iroquois sites.

The bowls varied in diameter from 1 inch to 2½ inches; their walls varied in thickness from ¼ to ¾ inch.

The pipes were of two kinds—stemless, or detachable, and stemmed.

Two fragmentary bowls were of the first kind. One (Cat. No. VIII-F-20556*b*) appeared to have been vasiform,[36] with a circular lateral cross section and a conoid bowl cavity. The second bowl (Pl. XX, G, *29*), the upper part of which was missing, was oblong in cross section, was decorated on three sides, and had a cylindrical stem hole at right angles to the bowl cavity. A hole $\frac{3}{32}$ inch in diameter, straight through the side about ¾ inch above the base, was probably intended to hold the cord which secured it to the stem. Two bowls of stemmed pipes (Pl. XX, G, *26*, and H, *9*), described more fully below, had holes for separate stems drilled into their sides after they were broken.

The majority of the pipes had stems which were for the most part round in cross section; others were either half round, oval, almond-shaped (the sharper part was at the top, as in Figure 18, *a*, in all but one), square (Pl. XX, G, *13*), or diamond-shaped (Fig. 18*b*). Two others, including the bowl, were like Figure 18*c* and *e*. The cross section of the stem of the broken pipe in Plate XX, I, *10* was like Figure 18*f* and was of the same shape as stems of many pipes from post-European Huron and Tionontati sites. The cross section of the fragment in Plate XX, G, *15*, part of which was round, was probably like Figure 18*d*. Tips of most mouthpieces were either rounded, straight, flared, or nipple-shaped. One mouthpiece was glossy, perhaps from being held in the mouth, and a deep notch on one side of another probably served as a toothhold. The longest stem was probably about 5½ inches in length, but no stems except those that had been broken and refashioned appeared to have been very short. They were about ⅞–1 inch thick where they joined the bowl, and ⅜–$\frac{9}{16}$ inch thick at the tip. Most stem holes were round and ⅛–¼ inch in diameter. Eleven stems were decorated (Pl. XX, G, figures *12–16*, *21*, and I, *10*). None of the bowls seemed to have been at right angles to the stems but were gracefully curved (Pl. XX, I, *5*).

Bowls of stemmed pipes were cylindrical, ovoid, barrel-shaped, shaped like an inverted cone or a truncated inverted cone, collared, trumpet-shaped, and square-mouthed. A few of these categories were divisible into subtypes.

Of four fragmentary bowls of the cylindrical type, only one was decorated (Pl. XX, G, *24*).

The ovoid type of bowl was represented by six fragments, all decorated (Pl. XX, H, *4*, *14*, *20*, *24*); the one in Plate XX, H, *4* was more massive than usual.

Barrel-shaped bowls were rare as compared with their abundance at the Lawson village site. Of seven specimens found, only one was whole (Pl. XX, H, *1*). The large fragments in Plate XX, G, *26* and *27*, were profusely decorated; one (*26*) had been transformed into a detachable pipe by drilling a hole through one side after the stem was broken.

Nineteen bowls and seventeen small fragments were of the inverted-cone type; some were crudely modeled. All but one were decorated (Pl. XX, G, *20*, *23*, *25*, *28*, *30*), one with two human faces modeled on the side (Pl. XX, I, *20*).

The truncated-inverted-cone type of bowl, of which there were thirteen specimens, all broken, consisted of a short collar with oblong depressions, usually at wide intervals, and in most cases with other decoration above and below, (Pl. XX, I, *1–4*).[37] The most noteworthy pipe of this kind is the one in Plate XX, I, *5*, on which, unlike most others, depressions were rectangular and the curved or elbow part of the stem bulged.

Bowls of the collared type were of three kinds. The first group included twenty speci-

[36] It seems to have been of the same shape as a stone pipe from Simcoe County, Ontario. *Cf.* Orr, 1924, at left on p. 121.

[37] Twenty-two bowls of the same type were found in pre-European Iroquoian (probably Huron) sites in Bexley, Eldon, and Fenelon Townships, Victoria County, as many as six being from a single site. See Boyle, 1898*a*, Fig. 5; Orr, 1917, left and right, top of p. 107; Wintemberg, 1931, Pl. XIII, Fig. 9. Others are known from Tionontati sites in Grey and Simcoe Counties, one being from a site only about a mile from the Sidey-Mackay site. See Boyle, 1889*b*, Fig. 6; 1891, Fig. 68; Orr, 1914, left, top of p. 83. So far as the writer knows, no pipes of this type have been found in Huron sites in York and Simcoe counties, which seems to suggest a closer connection between the culture of the Tionontati and that of the presumed Huron peoples of Victoria County than between that of the Tionontati and Hurons of Simcoe County. No bowls of the same type are known either from Neutral sites or from Irouqoian sites in New York State.

mens, the collars of which were either straight—as on these in Plate XX, H, *2*, *3* (with a circular bowl cavity ½ inch in diameter), *7*, *10*, *15* (with a low, flat elevation on top of the lip), *16*, and *21*—or shaped somewhat like the truncated-inverted-cone type. Collars were from ¼ inch to 1⅜ inches high. In the second group, represented by two specimens, sides of the collar were incurved (Pl. XX, G, *17* and *30*). Both kinds were decorated either with oval or lenticular depressions or with encircling lines, and in a few cases there was other decoration below or above and below the lines. The third kind, of which there were nine specimens, had wide, flaring collars, ¼–1⅝ inch thick, with flattened peripheries (Pl. XX, H, *8*, *9*, *12*);[38] one was apparently a variant of the trumpet type. Those shown in *8* and *9* of the same plates seemed to be modifications of the square-mouthed type, for they had four rounded elevations on top, with round or oval depressions below each elevation as in bowls of that type. The decoration on the bowl in *8* was very unusual.

There were fourteen fragments of bowls of the trumpet type, four of them crudely modeled, but only three were of the kind with thin, gracefully flaring lips common in most pre-European Iroquoian sites elsewhere in Ontario (Pl. XX, H, *5*). One was 2 5/16 inches in diameter across the top of the bowl; the lips of one (Pl. XX, H, *6*) were shaped like those of two bowls from the Lawson village site;[39] and the lips of two others were like those of another bowl from that site, except that they were not so thick.[40] Most were plain; the sides of one and the top of the lip of another were decorated (Pl. XX, H, *11*). Two fragments (Cat. No. VIII-F-19987*s* and Plate XX, H, *19*) were probably also parts of trumpet pipes, since the decorated, collared parts were similar to those on pipes of this type from post-European Tionontati sites elsewhere in Nottawasaga Township.[41]

There were fragments of fourteen square-mouthed bowls, a few of them of black ware. The corners of most were elevated; all except three (Pl. XX, H, *19*, and I, *6*, *8*) had oval or oblong depressions in the corners and other decoration on the sides (Pl. XX, I, *7*, *9*, *10*). One had oval depressions on each side of the corners, and one was unusual in having what seemed to be a flange-like projection on each corner (Pl. XX, I, *6*). The lower angle of the bowl of the specimen in Plate XX, I, *10* was notched. They were usually decorated (Pl. XX, I, *7–10*) differently from the majority of pipes of this type from post-European sites, most of which have two parallel horizontal grooves on the sides and oblong depressions on the corners only.[42] The square-mouthed type continued in use until late post-European times and has been found in Tionontati, Huron, and Iroquois sites and in pre-European sites in York and Victoria counties.

There were two fragments of bowls of a knobbed type. There is uncertainty regarding the exact shape of the whole pipe of which the specimen in Plate XX, H, *28* was a fragment; it was probably like that of one from the northern part of Simcoe County illustrated by Boyle.[43] The other fragment (Pl. XX, H, *27*) was part of a stemmed pipe and the stem was also probably knobbed. Below a line around the top was a row of widely separated, round, flat-bottomed depressions; there was also a similar depression in the top of each knob.[44]

On one side of another fragment, at the top of a crudely modeled bowl was a large nipple-like projection ½ inch long and ½ inch wide (Pl. XX, H, *26*); similar projections probably surrounded the top of the bowl

Fifty-two other fragments of pipes were too small to permit determination of type. Only a few of the more unusual ones (Pl. XX, G, *8*, *14*, *21*, and H, *13*, *17*, *23*, *25*) require special description. A curious, curved fragment of reddish earthenware with polished surface, a groove on the flattened concave side, and triangular cross section (Pl. XX, G, *8*) was probably part of a bowl. Figure *14* of the same plate (*cf.* Fig. *18a* for cross section) had four double rows of round depressions on the angles of the

[38] A pipe of nearly the same kind as this was found on an Erie site in western New York. See Parker, 1907, Pl. 31, Fig. 6. Another almost like it, too, was found near Venice, Cayuga County, N. Y. See Beauchamp, 1898, Fig. 176.

[39] See Wintemberg, 1939, Pl. XV, Fig. 18.

[40] *Ibid.*, Pl. XV, Fig. 19.

[41] *Cf.* Orr, 1924, illustration on p. 123.

[42] See Boyle, 1892, Fig. 7, showing one from a post-European Iroquois site at Baptiste Lake, Hastings County; Smith, 1923, Pl. LXVII, Fig. 3, one from the well-known late post-European Iroquois site at Lake Medad, Halton County; and Orr, 1919, p. 109, several from post-European Huron sites in Medonte Township, Simcoe County.

[43] Boyle, 1904, Fig. 14.

[44] A stem apparently from a bowl of the same shape, from a pre-European Seneca site in Ontario County, N. Y., is illustrated by Parker, 1908, Fig. 7, *3*.

beveled top and below them. The fragment in Plate XX, G, *21* either had the same cross section as Figure 18*c* or was pentagonal; it was decorated on top and sides. The fragment in Plate XX, H, *25* probably was part of a square, pot-shaped bowl. Two of the bowls bore owl heads, and one was modeled to represent the head of some other kind of bird; the upper part of the bowl of one was modeled to represent a mammal head, and four others bore human faces or heads; these are all more fully described in the section on "Decorative Art."

Evidence of methods of manufacture was found in some bowls and stems. They were made of materials similar to those used at other Iroquoian sites, either clay alone or clay mixed with finely powdered grit; one had medium temper. Cavities of a few bowls seem to have been formed by modeling the clay around a cone-shaped core, apparently composed of grass bound with thongs or strips of bark. The sides of one cavity appear to show the effects of reaming after the clay had become partly dry.

Holes were formed in some stems by rough sticks or twigs, included as cores which were destroyed in the firing. In several other pipes, the hole was formed by either fascine-like cores (Pl. XX, G, *11*) or by twisted cords (Pl. XX, G, *10*, *11a*).

Owing to their slenderness, the stems were easily broken, and most of the pieces were discarded as of no further use. If the tip only was broken, the fractured end was ground off round (Pl. XX, I, *5*, *20*) straight, or cone-shaped (Pl. XXII, H, *22*). The usefulness of seven bowls with stems missing was similarly extended by smoothing the broken part, probably plugging the stem hole, and drilling another hole in the side for the reception of a wooden stem (Pl. XX, H, *9*). The broken lower part of one bowl was ground flat, and a large irregular hole for holding a stem was broken through the back (Pl. XX, G, *20*). One fragment of the elbow of a pipe had the broken larger end hollowed out, cigar-holder fashion.

Bone pipes. Two whole proximal phalanges of the wapiti and a scorched fragment of another with a large hole drilled through the proximal end and a smaller one through the distal articular facet, may have been used as pipes. It will be recalled that a pipe made of the same kind of bone was found at the Lawson village site.[45]

[45] See Wintemberg, 1939, Pl. XV, Fig. 17.

OBJECTS OF UNCERTAIN USE

The uses of several other artifacts of stone, earthenware, bone, antler, teeth, and shell were uncertain.

There were a few small objects chipped from chert and chalcedony, with one or more sides trimmed to an edge, which were probably not hide scrapers but may have been used to scrape objects of bone, antler, and wood into shape.

Two pebbles, one of them round and the other oval, were smoothed and blackened on one side from some unknown use; possibly they were pottery smoothers.

Two edges and both faces of a roughly triangular fragment of a sandstone object, $\frac{1}{4}$ inch thick, were smoothed, and a series of lines was incised on one of the faces.

Three small, spherical lumps of clay may have been children's toys or objects used in a game.

The smaller curved end of the splanchnic bone of a raccoon was worked to a blunt point. One end of what seemed to be part of a rib was ground to an obtuse point, a fragment of another rib had a row of ten notches on one side (Pl. XIX, D, *35*) and still another had twenty-four transverse incisions, at irregular intervals, along the inner curved or ventral-cephalic side (Pl. XIX, D, *42*).[46] The knife-like object in *41* of the same plate had sharpened edges and point. Both long edges on the upperside of a large, obtusely pointed implement that retained the marrow hole on one side had been smoothed. The shape of a hollow bone object suggested that it was used as a handle, perhaps for an awl; the severed end had been neatly smoothed.

Two antler objects, one cylindrical and the other tapered, had one end cut off square. The tips of six tines were similarly cut off, probably for use as stamps to produce round and half-round depressions on pottery. One, a fragment, was sharp at the small end (Pl. XIX, C, *4*). Another object, $\frac{7}{32}$ inch thick, was flat on two faces and tapered from end to end. A restored long antler object, lenticular in cross section and about $\frac{5}{16}$ inch thick, with a hole through the base, (Pl. XIX, C, *24*) may have been a dagger. A similar object, but made of bone, was found in the Roebuck village site.[47]

One bear canine with the tip of the crown ground off flat (Pl. XIX, C, *2*) may have been

[46] *Cf.* Hooton and Willoughby, 1920, Pl. 15, Fig. *a*. Willoughby classes them as musical instruments.

[47] See Wintemberg, 1936, Pl. XVII, Fig. 28.

used as a stamp for decorating pottery. The one in Plate XIX, C, *3*, was broken lengthwise and the broken surface of the crown had been ground smooth, perhaps for use as a knife. It differed from others from Huron sites in Victoria county[48] and the Roebuck village site[49] which were made of the same kind of teeth, flattened on the lower transverse diameter of the crown.

The use of the shell object in Plate XIX, D, *23* is uncertain, though it may have been part of an ornament.

TEXTILES

No actual textiles were discovered, but impressions of cords used as cores to form holes in stems of earthenware pipes and in the decoration of pottery gave an idea of the kinds and sizes of some of them.

The impressions in stem holes showed that the cords were twisted from two and three separate strands, most often two, and that they were from $\frac{1}{8}$ to $\frac{5}{16}$ inch thick, the majority about $\frac{3}{16}$ inch. They were of two kinds; one, of which there were twenty-one examples, was twisted to the left, and the other, comprising thirteen examples, to the right.[50] Most of the cords were more or less evenly twisted, the majority somewhat loosely (Pl. XX, G, *10*, *11a*), but a few tightly. A few had one or more of the twists wider than others. The component strands were from $\frac{1}{16}$ to $\frac{1}{4}$ inch thick, strands of all cords being of uniform thickness. It was uncertain if the fibers of most of the individual strands were twisted to the left or right, but it appeared that when the cord was twisted to the left, the fibers of the strands were twisted to the right, and vice versa. The cords were all probably made of vegetal fibers, some of them coarse and others quite fine.

The cord which was used to make part of the decoration on the pottery fragment shown in Plate XX, A, *12* was composed of two strands, about $\frac{3}{32}$ inch thick, twisted to the left and was about $\frac{1}{8}$ inch thick.

PROCESSES OF MANUFACTURE

The processes of manufacture represented at this site were the same as those employed by the people of the Uren, Roebuck, and Lawson village sites, described in the series of bulletins published by the National Museum of Canada, as Bulletins 51, 83 and 94, Anthropological series 10, 19, and 25, respectively. They need not be described here.

COMMERCE

There was very little evidence of commercial relations with tribes of other linguistic stocks. The small shell from which the bead in Plate XIX, D, *15* was made is a native of the Atlantic coast, where it ranges from the West Indies to Cape Hatteras, but it is hard to say who were the intermediaries, unless they were the Andaste, with whom the Hurons, and possibly also the Tionontati, were in alliance. The cylindrical and some of the discoidal shell beads also were derived from ocean shells and indicate trade with coastal tribes.

DECORATIVE ART

As at other Iroquoian sites, art was mainly decorative and consisted of geometric and life forms, the latter either incised, carved, or modeled; geometric forms preponderated.

Geometric elements comprised notches; depressions that were round, half-round, oval, ovoid, almond-shaped, oblong, lenticular, square, rectangular, triangular, curved or crescentic, crude or irregular; vertical, diagonal, horizontal, curved, and zigzag lines; and circles. Many patterns, including complex ones, were composed of one or more of these elements.

There were either V-shaped or rounded notches on the top edges of seventy-five pot rims (Pl. XX, B, *2* and C, *1*), in some cases on the castellations only (Pl. XX, D, *7*, *11*, *12*); on either the outer or inner angles of squared lips of sixteen rims (Pl. XX, A, *1–3*, *12;* B, *3*); on flanged lips like the one shown in cross section in Figure 15*m* (Pl. XX, A, *14*); on the angles of the sides and on the tops of the stone pipe in Plate XX, G, *5* and of two other stone pipes; on the sharp side of earthenware pipestems with almond-shaped cross sections (Pl. XX, G, *16*); on the four angles of one stem, square in cross section, and on one angle only of two other stems with the same kind of cross section (Pl. XX, G, *13*); on the lower angle of the projecting bowl and on each side and on the middle ridge of the stem of the earthenware pipe in Plate XX, I, *10;* at the top of the bowl of the pipe in Plate XX, I, *5;* and on the flat edge of

[48] See Boyle, 1904, Figs. 6–8.

[49] See Wintemberg, 1936, Pl. XIV, Figs. 2, 3.

[50] Cords, similarly used as cores for forming stem holes in earthenware pipes, from other Iroquoian sites in Ontario were also mostly twisted to the left. See Wintemberg, 1927.

the lip of a trumpet pipe not illustrated. There were very few notches on the lower angles of the collars, a common feature on pottery at the Roebuck site.

More or less circular depressions occurred on the outer angles, on the lip edges, and on the lower angles of the collars of a few rims; as the sole decoration on the outside of a few rims (Pl. XX, B, *3*) and on shoulders (Pl. XX, C, *7*); on the stone pipe in Plate XX, G, *6;* in parallel encircling rows on a few earthenware pipe bowls (Pl. XX, H, *23*); in a vertical row on another

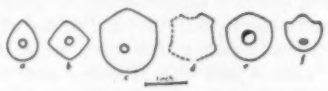


FIG. 18.—Cross sections of pipe stems from Sidey-Mackay site: *a*, of stem in Plate XX, G, *16; b*, of Cat. No. VIII-F-20696*b; c*, of stem in Plate XX, G, *21; d*, of stem in Plate XX, G, *15* (conjectural restoration); *e*, of stem in Plate XX, G, *14; f*, of stem in Plate XX, I, 10.

bowl; on the bowl and stem of the fragmentary pipe in Plate XX, G, *14;* on three angles of one stem and on four angles of another stem, square in cross section (Pl. XX, G, *13*); and to within ⅛ inch of the mouthpiece on the stem in Plate XX, G, *12*. They were combined with horizontal lines and other elements on a few pot rims (Pl. XX, A, *11;* B, *11*); and on the bowls of earthenware pipes (Pl. XX, G, *17, 19, 22–24, 28;* H, *4, 8–10, 14, 16, 19–21, 24;* and I, *2, 16*).

There were half-round depressions shaped like those in Figure 19, *Ai*, *Ay*, and *Be*, *Bf*, *Bi*, in a few cases in double rows, on many pot shoulders, and they were combined with other elements (chiefly encircling lines above or below the rows of depressions) on many others. The majority were shaped like those in *Be* and *Bf;* those like *Ay* were either vertically or horizontally placed with the straight side up or down. Depressions like *Aq*, *Bk*, and *Bl*, with one end wider than the other, which might also be classed as half-round, occurred on only a few shoulders and combined with other elements in a few others.

Oval depressions, some of them crude, mostly with the longer axis vertical but sometimes placed diagonally, were found on the exteriors and interiors of about forty pot rims, on a few necks, and on about forty shoulders, in four cases in double rows; they were combined with other elements on other pots (Pl. XX, A, *8, 9, 11;* B, *4, 8;* C, *1, 4, 5, 8, 13;* E, *2;* and F, *5, 6*) and on a few bowls of earthenware pipes (Pl. XX, H, *9;* and I, *9*). The depressions were so close together in some cases that they almost merged to produce an effect similar to the so-called "interrupted lines" on some of the pottery from the Uren village site.[51]

There were rows of ovoid depressions, some with straight sides, like those in Figure 19, *Ag*, *Ah*, *Aj*, and *Av*, on a few shoulders.

Rows of almond-shaped depressions, narrow as in Figure 19, *Ad*, wide as in *Ac* (Pl. XX, A, *10;* C, *11*) like *Ae*, or like *Af*, were the sole decoration on shoulders of many pots and were combined with other elements—chiefly encircling horizontal lines—on a few others. Some, especially the narrow ones, were placed diagonally, and others were in a position the reverse of that in *Ac*. The narrow depressions (*Ad*) occurred on over two hundred rims. Some of the depressions like *Ac* were quite large; in one case they were 1⅛ inch long and ¼ inch wide. Other depressions resembled the almond-shaped ones, except that one of the long sides was usually straight (Fig. 19*Ao*, *p*, *t*, *u*, *w*). Depressions like *Ao* (reversed, close together, or in double rows, in one of which they were placed alternately), *Ap* (pointed at both ends), *At*, *Au*, and *Aw* (the latter the most common), were the sole decoration on from three to sixty-two shoulders

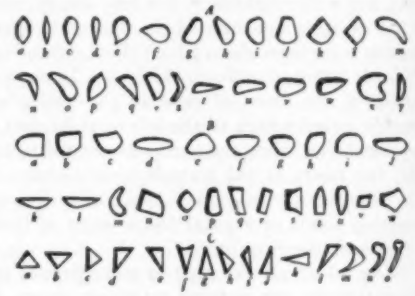


FIG. 19.—Outlines of decorative depressions on pottery and pipes from Sidey-Mackay site.

each and they were combined with other elements on three to twenty-seven others.

Oblong depressions occurred on the shoulders of a few pots, in one case in a double row and in others, combined with other elements, and on bowls of earthenware pipes (Pl. XX, I, *2, 3, 6, 7, 9, 10*).

Lenticular depressions (Fig. 19, *Aa* and *Ab*), placed vertically, diagonally, or horizontally,

[51] Wintemberg, 1928, Plate XI, Fig. 1.

sometimes in two rows, and at more or less regular intervals, were combined with other elements on eighteen rims, several shoulders (Pl. XX, F, *10*), and on a few earthenware pipes (Pl. XX, H, *7, 12;* and I, *4*). Each of these arrangements was the sole decoration on from one to seventy-five shoulders.

Depressions that were partly curvilinear and partly rectilinear, like those in Figure 19, *Ak, Al, Ba–Bd, Bg, Bh, Bj, Bn, Bt,* and *Bu;* various curved depressions like those in *Am, An, As* (Pl. XX, F, *1*), *Ax*, and *Bm*, some of the latter upside down and shaped like commas; and quadrilateral depressions, including those that were square rectangular (Pl. XX, I, *5*), some of which were diagonally placed as in *Br*, rhomboidal as in *Bv*, and others shaped like *Bs* and *Bw*, each occurred on a few shoulders, and in association with other elements on a few others.

There were single rows, in one case, a double row and in another, a triple row, of curvilinear diamond-shaped depressions like *Bo* on fifty-six shoulders, and depressions of this shape were combined with other elements on forty-one others.

Large, triangular depressions were the sole decoration on one pot rim and on the flat edge of the lip of an earthenware pipe bowl; others of various shapes illustrated in Figure 19, *Ca–Cm*, were the only kind of decoration on from one to thirty-four shoulders each and were combined with other elements on from one to fifteen each.

There were crude depressions on several shoulders, in a few cases combined with other elements.

Encircling rows of short vertical lines, from $\frac{3}{16}$ to $\frac{5}{16}$ inch apart (Fig. 16, A, *1*), were the only decoration on about five hundred rims (Pl. XX, C, *7*) and one shoulder fragment; in a few cases there were blank spaces, apparently at regular intervals, around the rim (Fig. 16, A, *4*). The lines were combined with other elements on many rims (Pl. XX, A, *2;* B, *1;* E, *1;* Fig. 16, A, *7, 10, 13, 16–19, 28, 36;* Fig. 16, B, *1–13, 17, 19, 24;* and Fig. 16, C, *1, 6, 9, 16, 17, 19*). In a few cases, the lines extended only part way across the collars. On three rims, some of the lines were vertical and some diagonal (Fig. 16, A, *15, 20;* and B, *2*). Three rims bore two rows of short vertical lines, those in the lower row shorter than those in the upper row on one and longer on the other two.

Short diagonal lines slanting to the left (Fig. 16, A, *2*) constituted the sole decoration on over nine hundred rims and on a few shoulders (in two cases on flat, encircling ridges on shoulders with the cross section shown in Figure 17, *g*), and they were combined with longer lines (the latter chiefly on shoulders and possibly parts of complex patterns) and other elements about one hundred fifty rims and shoulders (Pl. XX, A, *3, 6;* B, *11;* C, *14;* D, *1, 3, 5, 7, 11;* Fig. 16, A, *5, 6, 8, 9, 11, 12, 14–17, 21–34;* Fig. 16, B, *2, 5–28, 30–32,* and Fig. 16, C, *3–15, 18–28*). In a few cases, the long diagonal lines extended halfway across the neck below. On twenty-five rims, some of the lines slanted to the left and some to the right, sometimes leaving blank triangular spaces probably at regular intervals around the rims or below the castellated parts of the rims only (Fig. 16, A, *22*). Similar blank triangular spaces were formed by opposing diagonal lines slanting to left and right on four sides of the stone pipe in Plate XX, G, *5*.

Short diagonal lines slanting to the right (Fig. 16, A, *3*) were the only decoration on two hundred fifty rims (Pl. XX, C, *7*), and they were combined on others either with lines slanting to the left or with other elements (Pl. XX, B, *10;* D, *4, 12;* and Fig. 16, C, *3, 4, 11, 17, 21, 28–33*).

Horizontal lines, either single or in bands of from two to eight, were the sole decoration on a few rims, necks, and shoulders of pots and on the bowls of a few earthenware pipes (Pl. XX, G, *20, 30;* H, *1–3*), and they were also combined with other elements (Pl. XX, A, *4, 10, 11, 13;* B, *4, 7, 10, 18;* C, *10–12, 14;* D, *6, 10;* E, *1, 2;* Fig. 16, A, *7–10, 15, 18–20, 24, 26, 27, 35, 36;* Fig. 16, B, *1, 4, 24, 25, 29, 30, 32;* Fig. 16, C, *1, 2, 13, 17, 22–26,* and *28;* Pl. XX, G, *17, 19, 23, 27, 28, 30;* Pl. XX, H, *4, 6, 14–16, 18–21, 24, 27,* and Pl. XX, I, *1* and *5*). There was an encircling line on the flat lip edge of one pipe bowl. In some cases, the lines on the shoulders were in groups with a blank vertical space $\frac{1}{8}$–$\frac{1}{4}$ inch wide between each two (Pl. XX, E, *3*).

There were lines straight across the flat edges of the lips of four hundred forty rims; lines ran diagonally across the edges of about four hundred others, slanting to the left on about two-thirds of them.

Several diagonal encircling lines occurred on the bowls of two earthenware pipes (Pl. XX, G, *5, 17*).

Curved lines were combined with other elements on a few pot rims and shoulders, but some may not have been made intentionally (Pl. XX, A, *13;* B, *4, 15;* F, *10*).

There were zigzag lines on a neck fragment

(Pl. XX, F, *3*), some which do not show plainly on the side of the pipestem in Plate XX, G, *18*, and on the bowl in Plate XX, G, *25*.

There were circles with diameters of $\frac{1}{8}$–$\frac{3}{8}$ inch in vertical rows on three rims (Pl. XX, C, *9*, *11*; E, *1*) and in a diagonal row on another (Pl. XX, C, *12*). Two rows of circles alternated with encircling lines on the bowl of the earthenware trumpet pipe in Plate XX, H, *6*. The irregular circle around the hole for the stem of the stone pipe in Plate XX, G, *5*, was also probably intended to be decorative. There were single rows of semicircles combined with other elements on a few shoulders.

Patterns were composed of from one to eight of these different elements, and were either simple or elaborate. There was not as great a variety of complex patterns as at the Roebuck village site. Combinations of two different elements were seen more commonly on shoulders than on rims. The most elaborate designs were usually on rims; they also occurred on a few necks and shoulders and, in one case, on the side of a pot (Pl. XX, A, *4*, *5*, *15*, *17*; C, *12–14*; D, *11*; E, *1*, *2*; F, *2*, *4*, *5*, *7*; Fig. 16, A, *19*, *21*, *36*, and Fig. 16, C, *17*, *21*). In many cases, the decoration was elaborate below the peaked or castellated parts of the rims, whereas the rest of the rim bore simple elements, but there were not more than from one to about a dozen of each kind of pattern (Fig. 16, B, *12–14*, *22*, *26*, *27*, *32*, *33*, and Fig. 16, C, *4*, *7*, *13*). In some cases, reticulate designs covered the entire rims (Fig. 16, A, *11*), in a few others, these were found below the peaked parts of the rims only (Fig. 16, C, *7*, *8*). Chevrons composed of triangular (Fig. 16, A, *28–30*) and trapezoidal plats (Fig. 16, A, *23–27*), with alternate plats filled with lines running in opposite directions, were less common than at the Roebuck site. On a neck there was a design like Figure 16, A, *18*, composed of quadrilateral plats, with each alternate plat filled with vertical or horizontal lines. Designs like those in Figure 16, C, *29–33*, occurred extensively on shoulders; the majority were like Figure 16, C, *31*. Only a few of the complex patterns had oval or lenticular elements between some of the lines as in Plate XX, C, *4*; E, *1*, a common feature of ceramic decoration at the Roebuck village site.[52] A modification of the so-called "corn-ear" pattern on the rims illustrated in Plate XX, A, *8*, *9*[53] is like that on a fragment from Victoria County in the National Museum. Another, on two broken fragments which could not be fitted together (Cat. No. VIII-F-20654*c*) but which evidently belonged to one rim, seemed to have been about 2 inches high, and the grooves between the rows of "corn" were wider and deeper than on the fragments illustrated.

Complex patterns composed of one or more elements also occurred on earthenware pipes (Pl. XX, G, *26*, *27*; H, *4*, *24*), the most unusual one being that on the bowl in Plate XX, H, *8*.

There were very few life forms in comparison with the almost exuberant variety at post-European Tionontati and Huron sites.

Human forms which were rare here, consisted mainly of faces only. The treatment of the eyes and mouth of the face on the earthenware pipe seen in Plate XX, I, *16*, was like that of the conventionalized human face on a pot rim from the Roebuck village site,[54] except that the nose of the Sidey-Mackay specimen was distinctly indicated. The rows of pits across the top of the head were possibly intended to represent a head-band. The head in Plate XX, I, *18*, also from an earthenware pipe, was roughly modeled, with eyes and mouth crudely indicated. On another crudely modeled face from an earthenware pipe (Pl. XX, I, *17*) the eyes and mouth were indicated by small, oblong cavities; the head projected about $\frac{3}{4}$ inch above the top of the bowl. On the earthenware pipe with the rather curious combination of two modeled human faces, shown in Plate XX, I, *20*, the eyes, noses, mouths, and chins were crudely represented.[55] The best piece of modeling, and the only one at all comparable with the well-modeled human faces on pipes from the Roebuck village site, was the face shown in Plate XX, I, *19*, of which only a small fragment was found; it appeared to be of the same shape as one from a Tionontati village site on Lot 13, Concession I, Nottawasaga Township, illustrated by Boyle.[56] The remaining eye was represented by an oval elevation; the oblong depression in the ear-like projection was like

[52] See Wintemberg, 1936, Pl. II, Fig. 27, Pl. IV, Figs. 14, 15, Pl. VII, Fig. 2, Pl. X, Fig. 11.

[53] *Cf.* Boyle, 1891, Pl. II, Figs. 2, 6; Wintemberg, 1936, Pl. V, Figs. 8, 14, 18, 25.

[54] See Wintemberg, 1936, Pl. IX, Fig. 2.

[55] A nearly similar one from an Iroquois site in Onondaga County, N. Y., is illustrated by Parker, 1922, Pt. 2, Fig. 83 (second from left).

[56] See Boyle, 1891, Fig. 77.

those on other human-face masks from Iroquoian sites[57] which probably represented the ears of a head-dress made from the skin of a bear's or wolf's head. The eyes of a face from a limestone pipe (Pl. XX, G, *7*) were represented by oval pits and the mouth, by an oblong cavity; the forehead and nose were well formed, although the nostrils of the latter were not indicated. Nostrils were indicated, however, on a large, prominent, aquiline nose broken from a modeled earthenware face mask (Pl. XX, I, *15*). The projections on one side of a fragmentary earthenware pipe (Cat. No. VIII-F-20817*r*) may have represented either the arms or legs of a human figure modeled on the bowl (Fig. 20, *c*).

FIG. 20.—Drawings of incised human form, carved bird, and modeled human forms on pipes from Sidey-Mackay site: *a*, incised human figure on side of pipe in Plate XX, G, *5*; *b*, conjectural reconstruction of side of bird effigy pipe in Plate XX, G, *9*; *c*, stem fragment of pipe and cross section (Cat. No. VIII-F-20817*r*).

The body of the incised headless human form on a stone pipe (Pl. XX, G, *5*), seen in Figure 20*a*, was rectangular. One arm, bent upward at the elbow, was directed to the right, and the other, also bent and partly in contour, was directed downward. The legs bent forward at the knees and the feet appear to have been indicated, though rather faintly.

The head from the bowl of the earthenware pipe seen in Plate XX, I, *12* may represent that of a dog, a wolf, or a fox,[58] with eyes indicated by round pits, ears, by rounded knobs, and the mouth, by a groove on each side of the jaw. The underside of the jaw was hollowed, as on some other mammalian and bird heads from Iroquois sites in Ontario.[59]

There were only a few representations of birds. On the heads of two bird forms broken from earthenware pipes, one of them with the face badly mutilated, the eyes were represented by deep, crudely made, saucer-shaped cavities. The mouth of the one illustrated in Plate XX, I, *13*, was indicated by a groove on each side of the beak, and the back of the head was covered with trailed vertical lines. The eyes of the other head seem to have been surrounded with small round pits, as in a pipe from another Tionontati site illustrated by Boyle.[60] The back of the head was covered with slightly curved, oblique trailed lines, some of which converged at top and bottom (Pl. XX, I, *14*).

The lower part of a sandstone bird effigy pipe shown in Plate XX, G, *9* and Figure 20, *b* (conjectural restoration) had a rounded projection at the front which represented the feet, like so many bird effigy pipes described by Laidlaw.[61] The tail feathers are indicated.

A crudely modeled head of a bird, mammal, or human effigy, broken off at the mouth, (Pl. XX, I, *11*) had the eyes and nose, or beak, crudely indicated; the horn-like projection on one side of the head (the one on the other side was broken off) suggested that the specimen was intended to represent the head of a horned owl. One fragment was from a pipe bowl which may have been of the same type as some from other Iroquoian sites in Ontario, in which the open mouth of the bird formed the bowl cavity.[62] A curious, curved fragment of a pipe (Plate XX, G, *8*) may have been the tail of a bird effigy.

A fragment of a lug-like part of an earthenware pipe bowl, broken on a side and an end, not illustrated, may have been the head of a serpent coiled around the bowl; a few examples of these have been found in Tionontati[63] and other Iroquoian sites.[64]

BURIALS

No graves were discovered by the author, although test holes were dug in the more promising parts of the site and in an adjoining field to the west of the road. Mr. Herbert Webster, one of the former owners of the part of the site on the Mackay farm, once plowed up

[57] See Boyle, 1898*a*, Figs. 13–15; Smith, 1923, Pl. LXIX, Fig. 5.

[58] See Boyle, 1905, Fig. 31, showing one from a Huron site on Lot 10, Concession III, South Orillia Township, Simcoe County. A fragment of another, but more massive bowl, from another Huron site, on Lot 2, Concession VI, Tay Township, Simcoe County, showing a similar type of head, is illustrated by Orr, 1919, at top of p. 101.

[59] See, for example, a mammal head from a stone pipe from the Seeley farm, Brant County, in Boyle, 1900, Fig. 4.

[60] See Boyle, 1891, Fig. 71.

[61] See Laidlaw, 1903, Figs. 28, 31.

[62] See Boyle, 1888, Fig. 12; 1889*b*, Fig. 11; Wintemberg, 1936, Pl. XVI, Fig. 9.

[63] See Wintemberg, 1931, Pl. XIII, Fig. 14.

[64] See Boyle, 1892, Fig. 6; Wintemberg, 1936, Pl. XVI, Fig. 2.

a human skeleton south east of excavation 6. A local school teacher, Mr. Stacey, afterwards secured the bones and kept them in the school, but it is not known what became of them subsequently. Mr. Frank E. Webster, of Creemore, told me that some years ago human bones were rooted out by pigs on the Sidey farm.

If the people of the site practised communal burial, there should be an ossuary somewhere in the neighbourhood, but all the burials of this type so far recorded were post-European.[45]

Stray human bones. As compared with Roebuck and Lawson village sites, there were very few scattered human bones. The eighteen found include six fragments of skulls; two broken humeri, one of which had the distal joint hacked and broken off and appears to have been boiled; two fragments of radii, which also appear to have been boiled; a fragment of an ulna with one end hacked and broken off; two metatarsals, both perhaps, parts of recently disinterred skeletons; and one incisor and three premolar teeth.

IDENTITY OF THE INHABITANTS

The inhabitants of the site were Tionontati or Tobacco Nation Indians, who were known to have inhabited the territory in historic times. The culture of the site is similar to that of the Hurons, who were closely related to the Tionontati both in language and customs.

SUMMARY AND CONCLUSION

The inhabitants of the Sidey-Mackay site depended for subsistence on wild species such as plums, butternuts, and acorns; on cultivated species such as maize—apparently of two varieties—beans, sunflowers, and squashes; and on local mammals, birds, reptiles, fish, and freshwater mollusks. They depended almost entirely also on local supplies of materials for use in the manufacture of artifacts; a few others that were not present locally could have been obtained within a few days' journey from the site; only the material for a few shell beads had to be imported from a distance.

Artifacts used in securing food showed less variety than at the Roebuck village site; certain ones—chipped points—were more abundant than at that site, others—harpoon points—were more abundant than at the Lawson village site. The chipped arrow points of chert were mainly triangular; others were leaf-shaped and notched, the latter being derived from triangular points. Two barbed, triangular points of antler were channeled on both faces at the basal end to facilitate insertion in the cleft arrow shaft. Another antler point was of the hollowed, cone-shaped type. The harpoon points, all of antler, were unilaterally or bilaterally barbed; one of the latter was unusual in having the base socketed for the reception of a shaft. Only two of the stone artifacts could have been used as net-sinkers.

Objects used in the preparation of food consisted of knives, mullers, mortars and pottery. Over 12,000 sherds pertaining to about 2000 pots, were found. Judging from the shapes of the larger fragments, four types of pots were represented: the first, small and cup-like; the second, pear-shaped, with the rim rising more or less vertically from the shoulder; the third, with flaring mouth; and the fourth, with overhanging collar. Many had peaked elevations or castellations on top of the rims. Many rims had spout-like lips—one was double and one had a vertical projection about an inch high at the angle—all of which were probably more ornamental than functional. Some had elaborately shaped rims; one, which was octagonal, was probably brought here from central or eastern Ontario. A few had handles. Most unusual were the pointed shoulders on some pots. The surface finish was not as good as that on pots from the Roebuck village site, but some pieces appear to be harder and most of them contain finer tempering; a few contain shell tempering. All but a few pots were decorated, but fewer rim interiors were decorated than is the case at other Iroquoian sites; the most elaborate decoration occurred on some shoulders, in one case in a zone over five inches wide.

Tools used in various activities of men consisted of stone adzes; ungrooved stone axes; chipping or flaking tools of antler; hammerstones; anvil stones; tools made of teeth, chiefly beaver incisors; whetstones or grinding stones; and a point for a drill; all of these are of the kinds found in Iroquoian sites in southwestern Ontario.

Tools used by women comprised a few clamshell scrapers or formers; scrapers of chert; a fragment of a bone fleshing tool of a type found in other Tionontati and in Huron sites and apparently used only by these two Iroquoian

[45] The nearest is on the Alex. Perry farm, Lot 5, Concession IV, about 2 miles southeast of the Sidey-Mackay site.

peoples; bone awl-like tools, one made of a human ulna, like those from other Iroquoian sites; and perforated bone netting needles.

Articles of personal adornment consisted of pendants of shell and teeth; a fragment of an antler armlet; and beads of stone, earthenware, bone, shell, and fragments of earthenware pipe stems smoothed at both ends. Some of the shell beads were made from shells of local freshwater snails, others, from a small whole shell or from columellae of large marine forms. The more unusual beads were discoidals made from pieces of freshwater clam shells. Unlike the Hurons of Victoria County, the people of the Roebuck village site, and the pre-European Neutrals, the people of this site did not use bone or antler combs.

Articles probably used in games and amusements consisted of disks of stone, potsherds and modeled earthenware; deer phalanges fashioned into what were probably units for cup-and-pin games; and flattened phalanges also possibly used in a game.

Perforated fragments of turtle shell may have been parts of hand rattles used in religious ceremonies.

That the inhabitants of the site smoked tobacco was abundantly proved by the large number of pipes of stone and earthenware; also a few objects derived from phalanges of wapiti were possibly used as pipes. Most of the stone pipes were of the stemless or detachable kind; only a few were monolithic stemmed forms, and these were fragmentary. One of the detachable pipes was carved to represent a mammal, and one a bird form. A carved human face seems to have been part of a stemmed bowl. Many earthenware pipes, two of which were detachable or stemless, were found, all or most of them of the same types as those found at other Tionontati sites in the same area. Bowls of the stemmed pipes were of several different types—cylindrical, ovoid, barrel-shaped, inverted-cone type, truncated-inverted-cone type, collared, trumpet, and square-mouthed. Only one of the pipes is of the black, glossy-surfaced ware common in post-European Tionontati and Huron sites. There were modeled heads of the owl, mammals, and human beings on one side of the bowls, and there were two human faces, one beside the other, on one bowl. An interesting feature of some of the stem holes was their formation by modeling the clay around fascine-like cores or twisted cords, which were destroyed in the firing.

The decorative art of the people of this site, although probably not as rich as that at the Roebuck village site, was a little richer than that at the Lawson village site. The chief medium for artistic expression was pottery and stone and earthenware pipes. One of several different elements either formed the sole decoration on rims, necks, and shoulders of pots or was combined with from two to eight other elements to produce either simple or elaborate patterns. All the more complex patterns, such as the reticulate and several forms of so-called chevrons, were used. The most complex pattern was on the side of a more or less straight-sided pot, and many other complex patterns occurred on rims and necks. There were a few impressed circles on three pieces of pottery, but these and other features suggested that the pots were brought to the site, probably from villages east of Lake Simcoe. The most common ornamentation on rims consisted of rows of short vertical and diagonal lines slanting to the right or left. A most unusual pattern occurred on the bowl of one earthenware pipe, but most of the designs on pipes were simple. Realistic, or life forms, were represented by two figures of mammals (one, on an earthenware pipe, consisting of the head only), two owl heads, a broken bird-effigy, and five human-face masks from as many earthenware pipes and one from a stone pipe; all of them were poorly modeled. There is also a full-length, headless human form incised on one side of a stone pipe. There were fewer life forms than at the Roebuck village site and fewer even than at post-European Tionontati and Huron sites.

No burials were discovered by the author, but single burials had been found previous to his exploration of the site. A few stray human bones, some of which showed marks of hacking and others of which appear to have been boiled, suggest that the people practiced cannibalism.

The discovery of a piece of sheet brass in one of the deposits suggests that the site was probably not prehistoric, but it is certain that it could not have been inhabited long after 1615, for no other articles of European origin were found.

The site was probably that of the Tionontati, because it is located within the area known to have been occupied by them in historic times. The following traits at the Sidey-Mackay site were common also at several sites in Victoria County and at the Roebuck village site: flattened objects made of deer phalanges,

pottery with impressed circles, pinched notching along the lower angle of collars, certain highly elaborated rims, and the method of forming holes through the stems of earthenware pipes by inserting cords as cores. All these traits suggest that the Tionontati inhabitants of the Sidey-Mackay site were more closely related to the people of Victoria County and to the Mohawk-Onondaga inhabitants of the Roebuck site than they were to the Neutrals, Erie, and Seneca. As against the other traits of the Sidey-Mackay site which cannot be duplicated at Neutral sites, so far as our knowledge of the culture of that people can be depended upon, it may be significant that most of the decoration on pot rims at both the Tionontati Sidey-Mackay site and the Neutral Lawson site consisted solely of either vertical or diagonal lines slanting to right and left.

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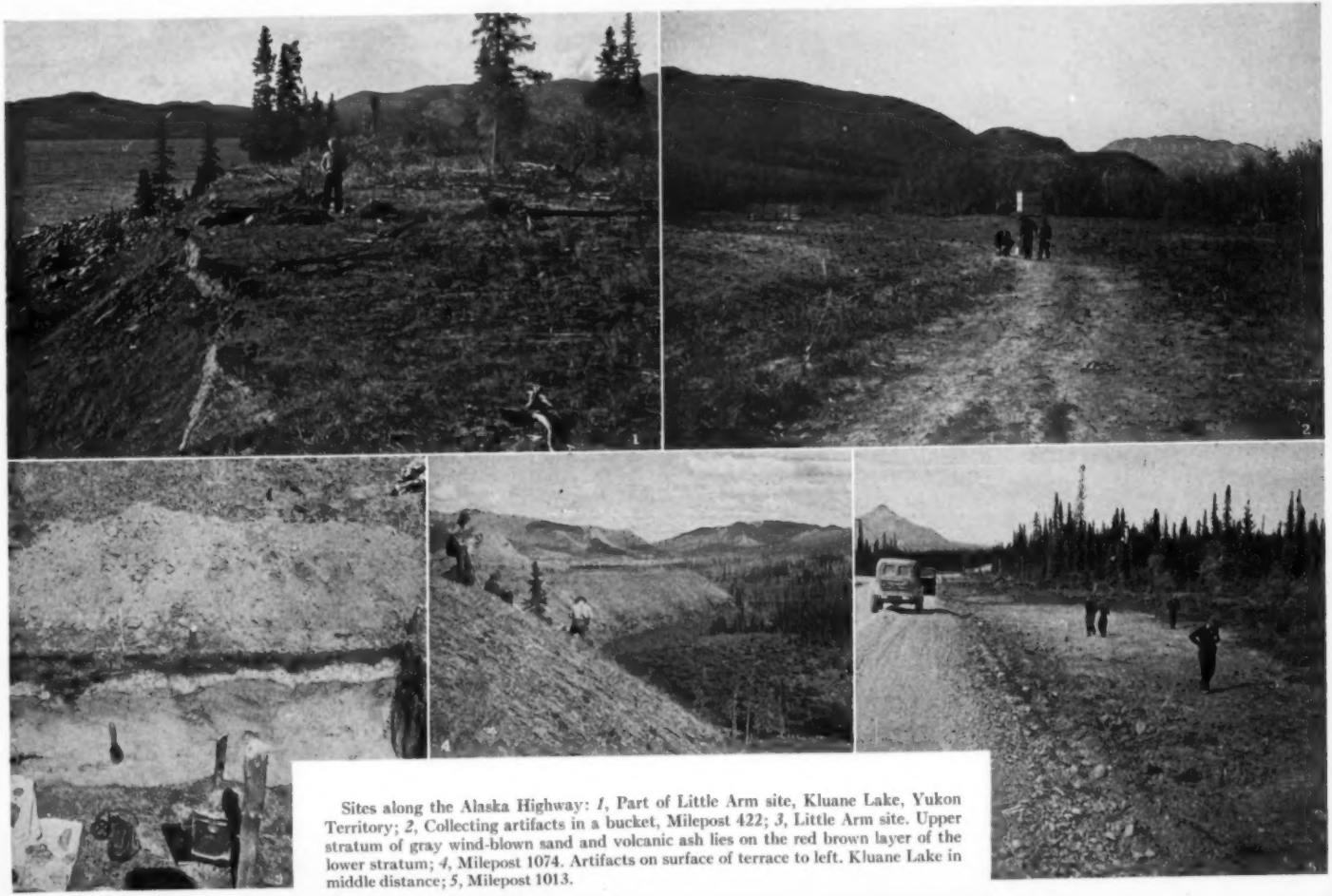


Sites along the Alaska Highway: *1*, Part of Little Arm site, Kluane Lake, Yukon Territory; *2*, Collecting artifacts in a bucket, Milepost 422; *3*, Little Arm site. Upper stratum of gray wind-blown sand and volcanic ash lies on the red brown layer of the lower stratum; *4*, Milepost 1074. Artifacts on surface of terrace to left. Kluane Lake in middle distance; *5*, Milepost 1013.

AN ARCHAEOLOGICAL SURVEY ALONG THE ALASKA HIGHWAY, 1944

FREDERICK JOHNSON

THIS is a brief, preliminary account of some of the discoveries made during the summer of 1944 when the author, in collaboration with botanists and a geologist conducted an archaeological survey of the region traversed by the Alaska Highway. The investigations were carried on in but a small section of an area, many thousands of square miles in extent, about which practically nothing was known. A similar survey had been made, in 1942, by Froelich Rainey, but unfortunately this was unsuccessful. However his previous excavations in the Yukon and Tanana River valleys in Alaska did give some indication of what might be discovered. Oscar Lewis had had better luck for he had found a few very interesting artifacts at a site on the Highway near Trutch.

As has been pointed out many times, this vast area lies athwart theoretical migration routes into North America. Though the routes have been described from inadequate maps of the region, practical considerations have prevented exploration on the ground. Now that the Highway provides access to the region it is possible to search for remains of "early man" in the region. It is only in this way that problems concerned with man's migrations to the continent will be solved. Furthermore, the history of the occupation of the region by the ancestors of the modern Indians can only be learned from excavations in the territory they occupied.

Purely archaeological considerations were but a single feature of the investigation. The collaboration with the fields of botany and geology, made it possible to develop hypotheses which had considerable depth. Even more important was the fact that the solution of problems of mutual interest promised to aid materially in the explanation of any archaeological information which might be secured.

During the previous season the botanical and geological survey,[1] working on the southern section of the road between Dawson Creek and Whitehorse, had gathered a mass of information concerning vegetational sequences, particularly the development and spread of various types of forests. These had been correlated with the development of soils and other geological events, producing a three dimensional picture of the region. Upon this background, preliminary hypotheses concerning the vertical and horizontal distribution of archaeological remains were developed. The statement and elaboration of these hypotheses is reserved for a projected study. Here it will suffice to brief certain data of interest mainly to the archaeological field.

The 1944 expedition took to the Highway at Whitehorse on June 14. The first base camp was made about 100 miles west, at Pine Creek in the Alsek River valley. After two and a half weeks, during which no evidence of prehistoric man was discovered, the camp was moved westward to the eastern end of Kluane Lake. It was here that a beginning was made on the archaeological investigations. In addition, the region produced data of considerable geological

[1] In 1943 the botanical field work was under the direction of Dr. Hugh M. Raup who was sponsored by the Arnold Arboretum of Harvard University and certain other institutions. The geological survey was carried on by Dr. Charles Denney, then at Wesleyan University, but who is now with the U. S. Geological Survey at Washington, D. C. The expedition of 1944 was similarly organized, but with the addition of the author, who was sponsored by the Peabody Foundation, Phillips Academy, Andover. Dr. and Mrs. Raup, and their two sons, Karl and David, continued the botanical work. Dr. Denny's geological work was carried forward by Mr. John Sticht of the Department of Geology, Harvard University. Dr. Stuart K. Harris of Boston University served as cook, in 1944, and at the same time collected birds and small mammals.

The botanical work was financed by generous grants from the Arnold Arboretum, the Milton Fund at Harvard, the American Philosophical Society, the American Academy of Arts and Sciences, the National Academy of Science, and the Society of Sigma Xi. The Geological Society of America bore the expense of the geological work and the expenses of the archaeological investigations were paid for by the Peabody Foundation.

The expeditions could not have gone out had it not been for the gracious loan of field equipment by the Department of Mines and Resources in Canada. Of crucial importance were the transportation facilities and the opportunity to purchase subsistence supplies extended by the Northwest Service Command of the United States Army. The arrangement which made this possible was originally made by the Joint Economic Committees. It is impossible to express our great appreciation to all people concerned. Furthermore, the cooperation of the officers and men in the army, in carrying out their part of the program, contributed greatly to the success of the undertaking.

and botanical significance.[2] From Kluane Lake, the expedition went directly to Fairbanks, Alaska, where supplies were replenished. On the return journey the expedition camped for about two weeks in the valley of the Tanana River, at a place some seventy miles east of Big Delta. The next camp was set up at Burwash Landing, near the western end of Kluane Lake. A week spent in this region resulted in some additions to our knowledge of the archaeology of the region. The expedition next spent a few days at Pine Creek where the experience gained during the summer made it possible to find archaeological sites missed during the previous stay.

The remainder of the season was taken up by the journey over the southern and eastern portion of the road between Whitehorse and Dawson Creek. During the ten days thus occupied we reviewed the work of the previous summer and succeeded in discovering a number of prehistoric camp sites. Many of these promise to be of considerable value in the final summing up of the data collected. Sites were discovered at Milepost 861 in the Little Atlin drainage, Squanga Lake, Ten Mile Creek on the northeast shore of Lake Teslin, Teslin Village, Muncho Lake and "Little Muncho Lake," Milepost 422 on the divide between the Toad and Racing River, on Summit Lake the highest mountain pass on the Highway, Mill Creek near Milepost 363, and on the Buckinghorse River at Milepost 175. Some of these locations produced very few tools and were identified as sites only because of the number of chips. Because time was short it was impossible to investigate such places thoroughly. Careful work at these and other locations must be done eventually; it is certain that such work will be amply rewarded.

All sites partake of the nature of workshops. In every case both tools and chips, the result of stone working, were found scattered through the deposits. Nothing but stone artifacts was discovered. The tools were concentrated in certain levels in deposits and it has been assumed that such represent levels of occupation. Nothing was found that could be called a "floor" nor were any pits or the remains of habitations discovered. Only one fireplace came to light. This was at site 1074 where fourteen

[2] For additional reports on the expedition cf. Raup, Hugh M., "Expeditions to the Alaska Military Highway, 1943–44," *Arnoldia*, Vol. 4, No. 12, December 29, 1944, pp. 65–72.

Raup, Hugh M., "Forests and Gardens along the Alaska Highway," *The Geographical Review*, Vol. XXXV, No. 1, 1945, pp. 22–48.

Plate XXII

Obsidian arrowpoint, *15*, is made of a flake, chipped all over on the surface illustrated. The edge is retouched on this surface only. The surface of the other side is chipped only near the point. The stem has probably been broken off. *16*, is complete. It is thin and crudely chipped. The straight base and blunted point are probably the original ones. The surfaces of the arrowpoint, *35*, have been dressed by the removal of chips which begin at the edge and meet in the center of the artifact. The edge has been sharpened by a delicate retouch. *21* is a fragment of an obsidian arrowpoint chipped in a similar manner. *14* is crudely chipped on its surfaces. The edges have been retouched from one side only. The base is missing. *25–27*, 33, are bases of arrowpoints which have been crudely chipped. Notable are the edges of these bases which have been smoothed, perhaps from use.

1 is a plano-convex scraper of obsidian. *7* is a similar tool except that a notch has been formed on the right-hand corner. *24* is a cruder example of this same type and *30* is a rather large example of it. *11*, *12*, are scrapers made of chalcedony, notable are the graver points chipped into the right-hand corners of each specimen.

3, *5*, *23*, identified as gravers.

Retouched flakes are the commonest type of implement. Some of these *4*, *6*, *13*, *17–19*, *22*, *31*, *34* are extremely thin and exhibit an extremely fine retouch on one side only. On some of these, the chipping is barely visible to the naked eye. *40* may not be a tool, it is included because the right-hand edge may have been smoothed by use. *37* is a thick flake, retouched on two edges. The chipping was done from one side.

20, *32*, *38*, large knives, are not common on these sites.

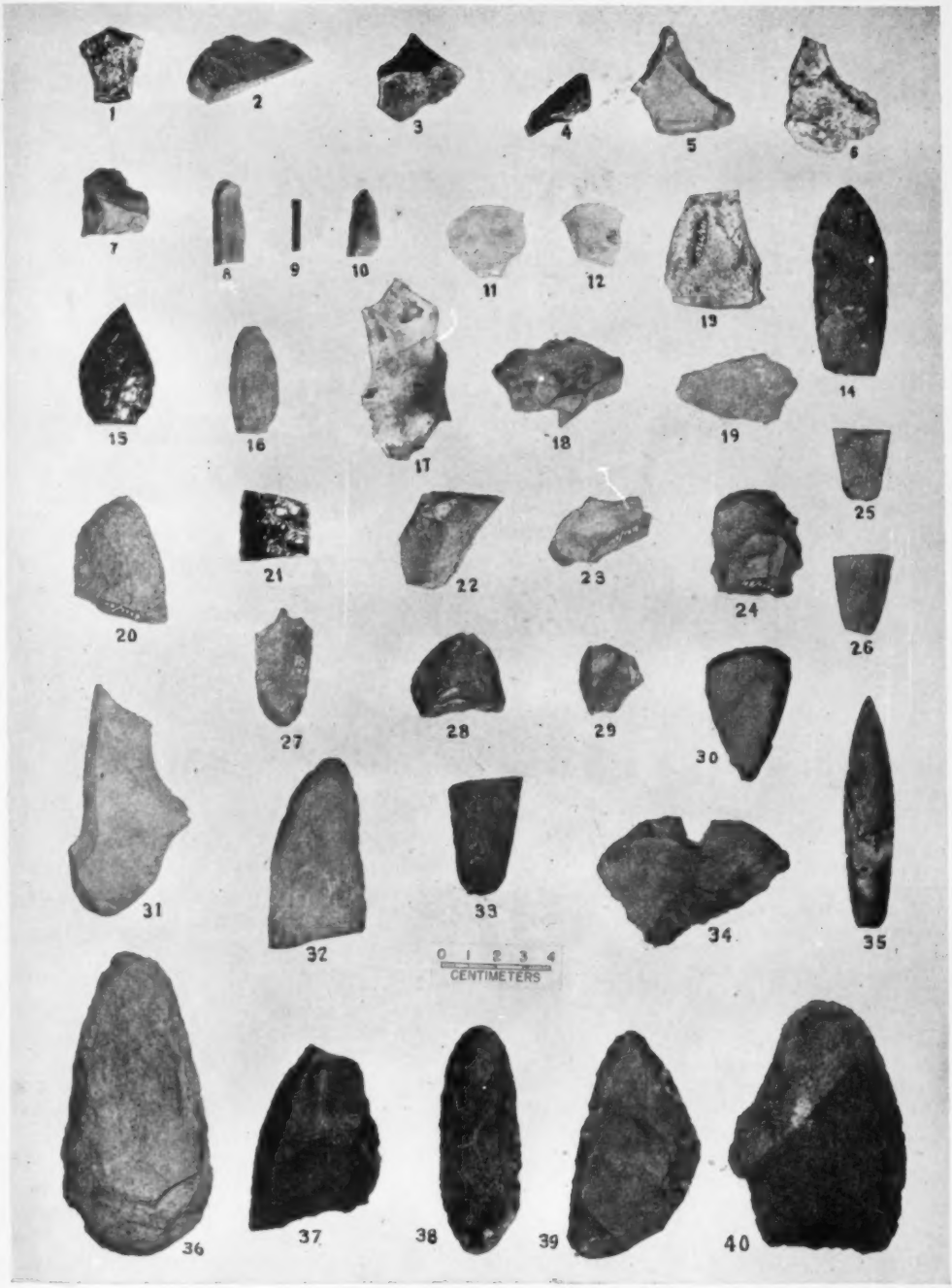
39 is a fragment of a large spearhead.

2 is a notched chip. Edges of the notch are not retouched but are sharp. Surface of the notch, when seen under a magnifying glass, shows signs of having been used.

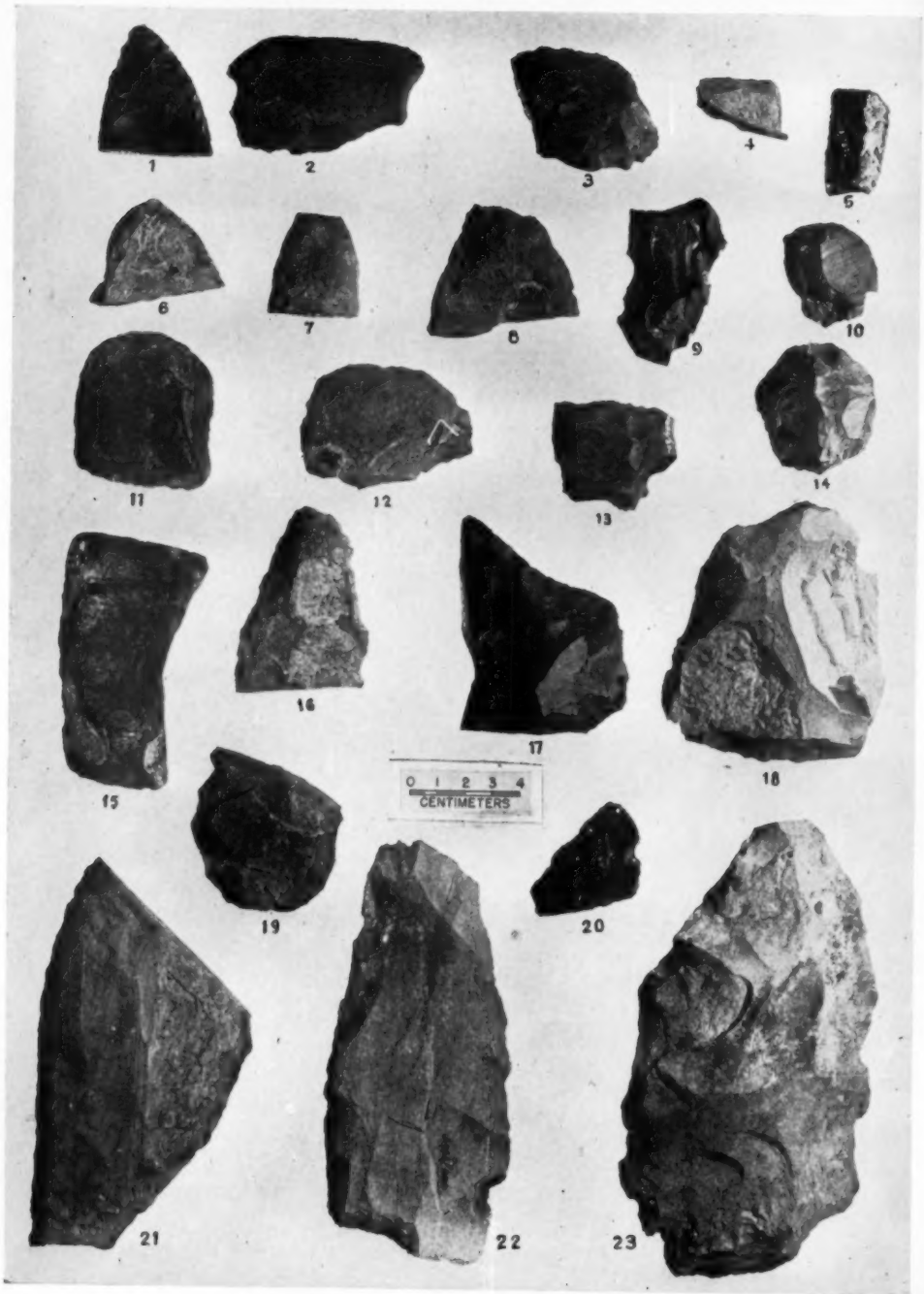
8, *9*, *10*, are prismatic flakes. *8* and *10*, the largest found, are illustrated because of their size; *9* is the commonest type. This was the only specimen which was retouched on one edge. *28* and *29* are cores from which prismatic flakes were struck.

36 is a large plano-convex scraper or adze. The face illustrated has been coarsely chipped all over. Edges of the specimen have been retouched on this face only. The other face has only been chipped near the apex, the original surface of the flake being visible on the lower end of the implement.

(*1*, *2*, *7–10*, *15*, *16*, *20*, *31*, *36*, Little Arm; *3–6*, *11–14*, *17*, cache in fireplace at site 1074; *18*, *19*, *24–26*, *30*, *35*, *40*, site 1074; *21–23*, *27–29*, *39*, Site 1013; *32* Canyon Creek; *33* bank of Pine Creek; *37*, pioneer road near Marshall Creek.)



Objects from sites along the Alaska highway.
(See facing page for explanation.)



Objects from sites along the Alaska Highway.
(See facing page for explanation.)

stone tools had been laid upon a bed of wood ash. In this ash was a piece of bone so badly disintegrated that it could not be recovered. Except for chips and other reject material there were no refuse dumps.

The artifacts from all sites are remarkably similar. Thin retouched flakes were the most common. Arrowpoints were relatively scarce. The remainder of the tools were large, falling into classes termed knives or chipped axes. West of Whitehorse the absence of the larger tools was striking. To the south and west we were fortunate enough to come upon varieties of chipped axes and large knives. Only two polished stone tools were found during the summer. These came from Squanga Lake. They are illustrated and described below.

Our first artifacts proved to be the key to the summer's good fortune. They were found at a site located on the southwest shore of the Little Arm of Kluane Lake (Pl. XXI, *1*). The Little Arm, which is less than ten miles long and three miles wide, leads to the northeast from the northern end of the lake. The site extends for about a mile along a terrace which is some eight feet above the highest level of the present lake.

Excavation revealed a cross section which, for present purposes, can be divided into two main strata (Pl. XXI, *3*). The upper stratum varies in thickness from 10 to 15½ inches and is composed of several layers. The first is made up of some 4 inches of gray, sandy, wind-blown soil, in which are roots of various kinds. Underlying this is a layer of volcanic ash which averages more than 5 inches in thickness. At various levels between the ash and the gray sandy soil are large, thin, lenses of peat, that is, compact masses of dark-colored vegetal material bound together by fine roots.

The lower stratum was investigated in detail to a depth of 29 inches; and holes, a number of feet deep, were sunk for purposes of rough examination. This stratum is composed of a deposit of fine sandy clay in which are rare, very small pebbles. The deposit is probably of aeolian origin. It was divided into three different-colored zones. The uppermost was red-brown and its thickness varied from some 4 to 6 inches. The thickness of the second, yellow-gray in color, averaged about 6 inches. The third was identified as gray, fine sand and clay; it was 4 to 6 inches thick. Below this appear gray sand and pebbles, the number and size of the pebbles increasing with depth until a yellow gravel, probably water-laid, is encountered.

All artifacts discovered in situ were in the red-brown layer of the lower stratum. All the tools and the larger chips were found buried in this deposit, in fact, some were in the zone of transition to the underlying yellow gray layer. Some minute chips were found scattered through the red-brown layer and even very near, if not on, the top of it. The conclusion is inescapable that the artifacts were laid down when the red-brown layer was exposed. It should be emphasized that no prehistoric artifacts or chips were found in the upper stratum.

Another site, called 1074 after the nearest Highway milepost was located on the west side of Kluane Lake. Artifacts were found on the edge of a terrace some 90 feet above the lake (Pl. XXI, *4*). The tools were distributed over an area about one mile long and less than one-quarter of a mile wide. Although modern forest fires and wind erosion had drastically modified the surface, it was evident that there had formerly existed a cross section identical with that found on the Little Arm. Furthermore, a number of artifacts found in situ, in the red brown sandy clay made it certain that the exposed artifacts had been derived from that layer.

Plate XXIII

7, *20*, fragments of large arrowpoints; note chipped and retouched notch in the right-hand edge of *20*. *1*, *8*, *16*, are fragments of spear points, chipped with varying degrees of excellence, perhaps due to variations in the material employed. *5* is a scraper of obsidian. This unusually well-made implement is sharpened on the blunt end and finely retouched on both edges. *10* is a large "thumb nail" scraper. *14*, *19*, scrapers, might be called "turtlebacks"; *19* is very crude indeed. *11*, *15*, very thin "skinning knives," edges of *11* are battered but not polished. The upper and lower edges of *15* have been polished, the sides are worn. Flakes retouched on one side, *2*, *4*, *6*, *9*, *12*, *13*, *17*, *21* were common on these sites as they were west of Whitehorse. The technique employed is practically identical except that in some cases thicker flakes were employed. Of particular interest is *21* which is large, the butt to the right is thick. *3* is a fragment of what may have been a larger tool, it is retouched on both sides. *18*, *22*, *23* are large chipped axes.
(*1*, *2*, *22*, Summit Lake; *3–4*, *7–10*, *12–14*, *16–18*, Milepost 422; *6*, *11*, *15*, Squanga Lake; *19*, *21*, *23*, Ten Mile Creek, Lake Teslin; *20*, Teslin Village.)

Discoveries in the Alsek Valley, about Pine Creek and elsewhere, showed that here, too, the ancient people had lived when the red brown sandy clay was exposed. Tools and chips were discovered in the red brown layer located on terraces above present, and sometimes past, watercourses. At site 1013 (Pl. XXI, *5*) artifacts were exposed on the surface of this layer as a result of road-making operations. Enough evidence was amassed, particularly at this site, to suggest the distinct possibility that all the artifacts had once been buried in the layer. In other localities, solifluction had so modified the archaeological deposits that the provenience of the artifacts was meaningless. Geological problems posed by the locations of the sites in this region are slightly different and perhaps more complicated than those encountered at Kluane Lake. In many sections examined in the Alsek Valley, the red-brown sandy clay is covered not only by occasional very thin layers of volcanic ash but also by deposits of clay which may be either wind-blown or water-laid, or both. In any case, the similarity of features of the artifacts and their location in the red-brown layer is reason for postulating cultural and temporal relationships between their makers and the people who made those found at Kluane Lake. Additional analysis will inevitably enlarge upon this unconfirmed judgment.

Discoveries in the Tanana River Valley east of Big Delta, between Mileposts 1383 and 1359, were less definitive. These were all surface discoveries in areas disturbed by the ubiquitous bulldozers and evidence of original provenience is tenuous. The sites were all on the edges of old river terraces and in each case the artifacts came from a layer of red-brown sandy clay which was quite similar in appearance to that found at Kluane Lake. The lack of an upper stratum corresponding to that in the Kluane Lake and Alsek Valley regions, plus probable differences in geological history, make it impossible to construct useful hypotheses at this time. However, similarities in technique and more rarely in form of the artifacts suggest that the cultural material is practically identical with that found in Yukon Territory.

The archaeological sites found east and south of Whitehorse are, at the moment, significant chiefly because of their geographic setting and because they extend the distribution of a cultural unit over a distance of about 1000 miles. It seems likely that the specimens belong at least to a broadly definable group of artifacts, having perhaps local variation. So we may trace the prehistoric artisans along a line running southeasterly from Alaska, over low divides and high mountain passes, out into the region where the Peace River drainage runs through the northern prairies. At the moment, emphasis can only be placed on the fact that this long strip of country was occupied. One may also note that one of the most practical routes from Alaska to the Plains runs along this strip. It may be pure imagination, but it seems possible that the discoveries during the summer of 1944 may point to one of the areas in North America which have been occupied for a long time. Now that access to the region has been provided by the opening of the Highway and since it is to be made easier by commercial aviation, it is to be hoped that detailed attention will be paid to this practically unknown region.

R. S. Peabody Foundation
Andover, Mass.
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THE OCCURRENCE AND SIGNIFICANCE OF SOUTHWESTERN GROOVED AXES IN CALIFORNIA

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TO THE archaeologist whose primary field of endeavor is California, the grooved stone ax is a relatively unfamiliar object, since it occurs but rarely either in the course of excavation or in the perusal of the literature. That the grooved ax occurs at all in this region is significant, chiefly for the reason that in western North America it is a form highly characteristic of, and, with few exceptions, restricted to the Southwestern culture province proper. Since southern California is generally considered a western peripheral extension of the Southwestern culture area,[1] it is not surprising occasionally to encounter the grooved ax here. It is interesting to note that this implement also occurs far to the northward in central and northeastern California, a region commonly thought to be beyond the zone of direct influence by or immediate contact with the Southwest proper. Presumably the grooved ax in central and northern California represents an extreme northwesterly extension from its native locale, which we assume to be the Southwest.[2]

The map (Fig. 21) shows five archaeological occurrences of the grooved stone ax. With the exception of the Hanford specimen collected in 1925, all are surface finds and are presumably late in time. So far as is known, none has been excavated from an archaeological site. Number 3 on the map represents a full-grooved ax found on a lakeshore campsite. The specimen was noted in a private collection at Goose Lake, Modoc County, by Mr. Franklin Fenenga, who has kindly permitted me to cite this information here. Number 4 (Fig. 22 *D*) is a surface find from a late archaeological site on Union Island in the Sacramento-San Joaquin River delta which produced historic material. The specimen was collected by the owner of the land and was noted by a University of California survey party in the summer of 1938. Number 5 indicates two separate finds of grooved axes on Santa Catalina Island. The first (Fig. 22 *A*) collected by Paul Schumacher in 1875 from the soapstone quarry on Catalina, is of the full-grooved, long-bitted type.[3] The second specimen (Fig. 22 *E*), now in the Museum of the American Indian, Heye Foundation, was collected about 1900 by E. L. Doran from a flower or vegetable garden, and is of the three-quarter-grooved type.[4] Number 6 represents two three-quarter-grooved stone axes which are now in the Hanford Museum, and which were collected in the vicinity in 1884 and 1925.[5] Number 7 refers to a number of axes of three-quarter- (Fig. 22 *B*) and full-grooved types collected at turquoise quarries in the Mohave Desert region by M. J. Rogers[6] but first described by Gustav Eisen.[7] These quarries were worked by people of the late Basketmaker and early Pueblo periods who made expeditions to the region for the purpose. We are faced with no doubts as to the origin of these particular grooved axes—they are pieces imported or made on the spot, as occasion demanded, by the Puebloan miners.

There are at least two stone axes in museum collections which were secured from living California Indians who stated that this was an implement used by them in aboriginal times.

[1] Kroeber, 1925, Chapter 59.

[2] Woodbury, 1939, Map 3, p. 69, gives the distribution of the three-quarter- and full-grooved ax in the Southwest. The area of distribution of the three-quarter-grooved ax, appearing in the Pueblo I period, has a north and east boundary running from the Hopi villages to Gallup and south to the Mimbres River. The full-grooved ax, appearing in the Basketmaker III period, has a distribution bounded on the west by the great V formed by the Little Colorado and Colorado rivers, on the east by the Rio Grande, and on the south by Central Arizona and New Mexico.

[3] U. S. Geographical Survey, 1879, p. 203.

[4] Heye Foundation, *Indian Notes*, Vol. 4, p. 66. Further information from G. G. Heye.

[5] Hewes, 1941, p. 128. Hewes' field notes state that both axes are made of black granite or basalt, and that they measure 55×100 mm. and 33×116 mm. The specimen found in 1925 came from a sewer trench in the city of Hanford, while the one collected in 1884 was found near Hanford on a ranch by the owner.

[6] Rogers, 1929, pp. 5–6. The number of axes is not stated, but Rogers notes that both types were found.

[7] A full scientific account of the discovery was made by Eisen (1898). He describes "stone hammers of various sizes, from six to eight inches long, beautifully smooth and rounded, each with a wide central groove extending across three sides of the hammer," and axes six inches square and larger "with a groove running all around the center for the secure holding of the handle."

One, a three-quarter-grooved specimen (Fig. 22 *F*) now on exhibit in the American Museum of Natural History, was collected about 1900 by R. B. Dixon from the Northeastern Maidu.[8] The second, now in the Chicago Natural History Museum, was collected in 1901 by J. W. Hudson from the Pomo at Ukiah.[9] The

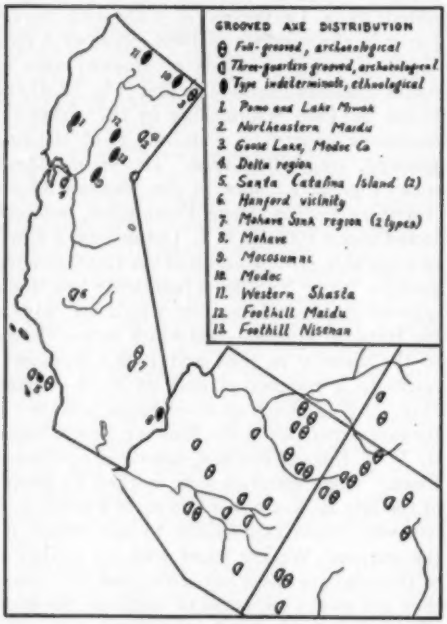

FIG. 21.—Map showing distribution of grooved axes.

Pomo specimen cannot be called grooved in a strict, descriptive, sense; rather, it looks like a very poor approximation of a full-grooved ax (see Fig. 22 *C*). The poll is thick and bulbous, and the bitt is thin and wedge-shaped with a sharp, rounded cutting edge. There is a definite side notch, but the specimen is not classifiable as a notched ax on the basis of this feature alone.[10] It is numerically and typologically unique, but because it bears a hafting (not typical for California), is polished (also non-Californian), and bears a superficial resemblance to the Southwestern grooved ax, the author is inclined to look upon it as a poor Pomo copy of the exotic grooved type. The picture is further complicated, however, by the presence of a flaked stone ax used for felling trees among the Pomo,[11] Wappo,[12] and River Patwin.[13] This ax was hafted by the Wappo, but was used as a simple hand tool by the Pomo and Patwin. Hafted stone axes, whether grooved and ground or roughly flaked, are not characteristically Californian. We may perhaps be allowed the suspicion that the hafting technique is of exotic (Southwestern?) provenience, and that its introduction is to be associated with the grooved stone ax itself, with later local associations developing around the indigenous flaked ax. It is not permissible to infer too much from the Ukiah specimen, since we know nothing of its origin. Conceivably its manufacture might be traced to Hudson's collecting trip. If so, its aboriginality is suspect.

A number of California tribes have claimed knowledge and use of the grooved stone ax. In general their statements appear to be supported by the archaeologic and ethnographic occurrences of this implement (see map).

The following native groups knew the grooved ax: Western Shasta of Klamath and Rogue Rivers, No. 12 on map;[14] Modoc of Tule Lake, No. 11;[15] Northeastern Maidu, No. 2;[16] Foothill Maidu, No. 13;[17] Foothill Nisenan, No. 14;[18] Lake Miwok, No. 9;[19] Elem or Southeastern Pomo, No. 9;[20] Plains Miwok, probably

[8] Dixon, 1905, Fig. 5. See also Kroeber, 1925, p. 418. Dixon's illustration appears at first glance to be that of a full-grooved ax, but N. C. Nelson states in a letter that it is of typical three-quarter grooved form.

[9] Gifford and Kroeber, 1937, note to Element 416, p. 181. Further data and illustration kindly supplied by Paul S. Martin of Chicago Natural History Museum.

[10] Well-formed, chipped, side-notched axes are found at the turquoise quarries in San Bernardino County, but, like their polished, grooved counterparts, they are imported pieces in fact or design (Rogers, 1929). There is no reason to suspect or assume direct relationship between these and the flaked hand axes from central California described below.

[11] Stewart, 1943, pp. 48, 53.

[12] Driver, 1936, p. 192.

[13] Kroeber, 1932, p. 283.

[14] Voegelin, 1942, Element 1234.

[15] *Ibid.*

[16] Dixon, 1905, p. 134; Kroeber, 1925, p. 418.

[17] Voegelin, 1942, Element 1234. Beals, 1933, p. 340, reports that one Nisenan informant described the grooved stone ax.

[18] Voegelin, 1942, Element 1234.

[19] Gifford and Kroeber, 1937, Element 416. Reference is made (p. 181) to the Ukiah ax collected by Hudson; this, however, is not a true grooved ax. The Elem Pomo-Lake Miwok affirmatives are to be viewed as doubtful in the absence of clarification.

[20] Gifford and Kroeber, 1937, Element 416.

Mocosumni, No. 10;[21] and Mohave, No. 8.[22]

The Western Shasta state that the stone ax became known to them only recently, presumably in full historic (post-1860) times. The Modoc knew the ax, according to Voegelin, and this statement is supported by the surface find of a grooved ax on the shore of Goose Lake.

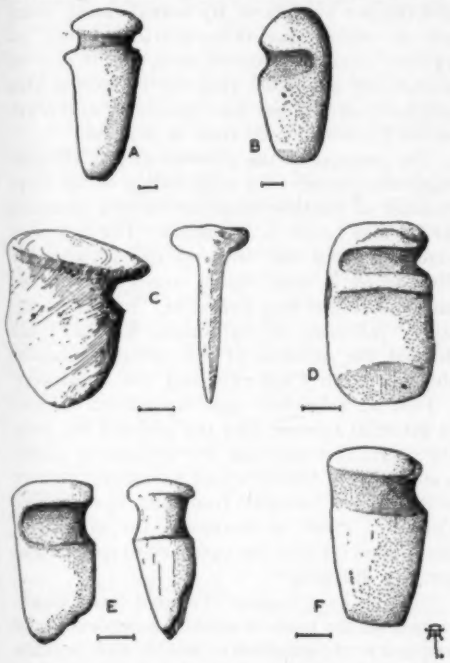

FIG. 22.—Grooved stone axes from California. *A*, Santa Catalina Island (Peabody Museum); *B*, Mohave Desert (San Diego Museum); *C*, Ukiah Pomo (Chicago Natural History Museum); *D*, Union Island, Sacramento-San Joaquin river delta region; *E*, Santa Catalina Island (Museum of the American Indian, Heye Foundation); *F*, Maidu (American Museum of Natural History). Each scale line equals one inch.

The Northeastern Maidu did not manufacture grooved axes but used those they found. The ax was used by them as a war weapon as well as a tool for felling trees; it was hafted by binding on a cleft stick. Kroeber says these Maidu axes "appear to represent an ancient, sporadic infiltration from the east."[23] The Foothill Maidu (Northwestern) and Nisenan (Southern Maidu) also claim knowledge of the stone ax, but no examples have been collected from sites in territory occupied by them. The Lake Miwok and Elem Pomo profess aboriginal use of the grooved ax, and this testimony is supported, though questionably, by an actual specimen from Ukiah now in the Chicago Natural History Museum (No. 70973). Mooney's second-hand account of the Plains Miwok in 1850 has been judged garbled and untrustworthy by Kroeber,[24] yet the suspected alteration of Plains Miwok culture by this date may have been extensive enough to account for the unusual culture elements recollected by Col. Z. A. Rice, the original observer.[25] Mooney says, "The bark was loosened from the trees by repeated blows with stone hatchets, the latter having the head fastened to the handle by means of deer sinews." The Mohave used grooved axes occasionally, but these were imported from their Puebloan neighbors.

The primary problems of the time and means of introduction of the grooved stone ax into California must now be approached. There is no direct and positive evidence of such introduction, but from what we know of Southwestern-Californian trade relations[26] and the contemporary ethnic situation, we shall be able to draw certain tentative conclusions concerning the importation of the grooved ax.

No ethnologist has recorded any native explanation, based on fact, for the presence of the grooved ax. The Maidu used stone axes (as they did stone mortars, charm stones, and tubular steatite pipes) which they found by chance at old village sites in their territory. A magical origin was attributed to these objects by the Maidu. The Pomo specimen remains unexplained, while the Mohave Desert axes are clearly pieces imported by the Basketmaker-Puebloan turquoise miners.[27] These turquoise

[21] Mooney, 1890, p. 259. This account probably refers to the Plains Miwok, and, less certainly and then only in part, to the Valley Nisenan of the Cosumnes River.

[22] Kroeber, 1925, p. 739.

[23] The grooved stone ax is generally absent in Utah (Northern Periphery) and Nevada (Western Periphery.) Thus Kroeber's postulated infiltration from the east is probably not correct, but at the time he wrote this was the only record of the grooved ax north of San Bernardino County, and for this reason his explanation was the most likely one then to account for the isolated Maidu occurrence.

[24] Kroeber, 1925, p. 959.

[25] *Cf.* Hiezer, 1941*a*.

[26] Heizer, 1941*b*.

[27] A large number of turquoise deposits in a belt running from the region of Silver Lake, California, eastward across the Nevada line and south into Arizona were worked by Puebloan peoples. It looks very much as though this "lode" had been prospected and worked, beginning in Arizona and progressively extending northwestward. A careful study of this aboriginal mining might have valuable results.

hunters, whose homes lay across the Colorado River, in Arizona and New Mexico, presumably came in some force for safety's sake, did their quarrying, and returned. It is unlikely that they had any important friendly contacts with the residents of the Mohave Sink during their brief, and probably sporadic sojourns, so we may dismiss the possibility that Anasazi miners introduced the various stone axes found in California—except those directly associated with the quarry pits.

Because the grooved ax is primarily a surface find, is not found in midden strata during site excavations, and yet was widely known to the California Indians, there is good reason to assume its late appearance on the aboriginal scene. North of the Tehachapi in the Central Valley the grooved ax probably was either not introduced or not widely disseminated much before 1800. From 1800 until about 1855, when native cultures were swamped by the Americans, the native tribes were in a state of flux.[28] Wider contacts, in part due to mobility, acquired with the use of the horse resulted in abundant material trade and diffusion of ideas.[29] This is probably the period of the northward spread and native use of the stone ax—an implement attractive to peoples who could acquire timber only by burning a tree at the base or by being content with deadfall logs and limbs—but a tool quickly supplanted by the steel ax brought by white gold miners, settlers, and traders.

This conception of a late introduction and spread of the stone ax is supported by a comparison of its distribution along the western slopes of the Sierra Nevadas, with contemporary locations of Indian groups.[30] We have additional evidence of northward movement of people and diffusion of culture up the eastern Central Valley and Sierran slopes at this time.[31]

It would appear, from inspection of the accompanying distribution map, that there was no single point of origin for the stone axes which were introduced to the California natives, since both full- and three-quarter-grooved types occur, however sporadically, as far north as the Oregon boundary. By actual count, there are on record five three-quarter-grooved, as against three full-grooved axes, and it may be tentatively suggested that the California axes originally came from the region near and south of the Little Colorado river in Arizona.

The problem of the grooved ax in California suggests another—the explanation of the large number of Southwestern-like culture elements which also occur in California. The list is so extensive, and the features are so variably distributed in time, space, and type that we must assume a long period of "Southwesternizing" influence in California. Kroeber[32] has defined the problem of the cultural relationships between California and the Southwest.

First we have the actual importation of items of material culture, like the grooved ax, from the Southwest through the system of native trade. Cotton blankets and occasional pottery vessels were brought from the east to the California coast to exchange for sea shells. Such items fall into the category of specific and primary diffusion.[33]

Next we have a series of shared traits which, judged on the basis of relative complexity and frequency of occurrence in the two regions, probably have been derived from the Southwest. For the southern California culture province we may note the following as exemplars of Southwestern connections: ritual altar of sand-painting, sometimes made with meal;[34] the lineage-fetish bundle-priest-ceremonial house complex;[35] curved throwing club for war and hunting;[36] pottery;[37] sweathouse-kiva parallel;[38] and stick swallowing.[39]

As to the time element in these South-

[28] Heizer, 1941*a;* Cook, 1943*a*, 1943*b*.

[29] It is not fully known what the imported trade materials were, but we may suspect the stone ax was one of the items, in view of the fact that some Puebloan goods were among the imports. This is an important point, because the Colorado River Yumans (chiefly Mohave) were the itinerant traders, but the ax was not a standard item of their culture. The Mohave were middlemen between the coastal and interior Californians and the Puebloans of interior Arizona and New Mexico.

[30] Heizer, 1941*a*, Map in Figure 10. The mere fact that the grooved ax is unreported in the coastal "Mission strip" may be significant of its late appearance further inland, since under the mission system there would be little opportunity or inclination to adopt the stone ax. For mission work the neophytes would use steel axes and saws.

[31] Heizer, 1941*a*.

[32] 1928, pp. 380, 382–385.

[33] Heizer, 1941*b;* Kroeber, 1910.

[34] Kroeber, 1922, p. 316; Dubois, 1908, Pl. 17; Strong, 1929.

[35] Strong, 1927, 1929, 1936; Kroeber, 1928.

[36] Heizer, 1942, pp. 50–51.

[37] Rogers, 1936.

[38] Kroeber, 1922, p. 265.

[39] Dubois, 1908, Pl. 16; Kroeber, 1925, p. 665; Waterman, 1910, p. 328; Parsons, 1939*b*, Vol. 1, pp. 440–442.

western-southern Californian culture connections, the presence of Pacific Coast *Olivella* and *Haliotis* shell beads and ornaments in Basketmaker sites[40] and of various items of Southwestern origin in Pacific Coast shell mounds, some of which are datable,[41] leads to the conclusion that southern California and the Southwest have been in contact, through commodity exchange, fairly continuously for at least the past thousand years. With trading expeditions, would come contact with and knowledge of the Californian peoples, and perhaps some exchange of other ideas or concepts in the nonmaterial realm.

For central California we may list the following as probably of Southwestern origin: scalping (Central California Kuksu cult, Pueblo an Warrior Society);[42] arrow sacrifice of war prisoners (Patwin, Northeastern Maidu, Central Mexico);[43] fired clay human figurines (Coast Miwok?, Pomo, general Puebloan Southwest);[44] ceremonial cannibalism by relatives of the slayer of a man killed in war (Costanoan, Central Mexico);[45] arrow offerings and feathered prayer-sticks (Maidu, Costanoan, Chumash, Gabrieleno, Diegueno, general Southwest, Mexico);[46] prayer addressed in four directions (Southern Maidu, general Puebloan);[47] eagle capture and rearing;[48] bullroarer;[49] and footdrum.[50]

In Loeb and Kroeber's records of Pomo ethnographic data there is a long list of fairly specific cult resemblances to the Southwest. It includes matrilineal tendencies, meal offerings, ritual pole climbing, rattlesnake ceremony, spirit impersonations associated with curing, shamanistic societies, new fire ceremony, clowns, and bullroarer.[51] Kroeber,[52] in a discussion of Loeb's data,[53] was of the opinion that the list of resemblances was too slender to indicate that the Pomo were historically dependent upon the Southwest, particularly since matrilineal inclinations, pole climbing,[54] and shamanistic societies are lacking in south-central California, but that some connection is indicated for the specific traits and that "the nature and route of transmission may become clearer with fuller knowledge of the intervening groups." Loeb later added to the Pomo list of Southwestern-like traits and proposed that the stimuli reached central California, not through the Yokuts-Miwok axis, but along the west coast—via Salinan, Esselen, and Costanoan territory—on the basis of the presence there of meal offerings to divinities, arrow offerings, and feathered-rods ("prayer sticks").[55] At about the same time Kroeber, in his analysis of the central California cult systems, concluded that "there are enough specific and generic similarities between the Kuksu, Southern California, and Pueblo cult systems to render pedantic an insistence on the wholly independent origin and parallel development of these."[56] On the basis of this study of organized ceremonials, Kroeber proposed " . . . an ancient greater areal continuity of a more generalized initiating form of cult; which also allows the previously assumed stimuli to have been fairly concrete, though limited in character, instead of mere concepts or ideals." And further, if the Southwest was the point of origin of these stimuli, these were probably derived

[40] Brand, 1938; Gifford, N.D.

[41] Heizer, 1941*b*, p. 186. E. F. Walker (1945, p. 193) notes Hohokam sherds found at the Tujunga wash site, Los Angeles County, and dated by E. W. Haury as of seventh to ninth century A.D.

[42] Loeb, 1926, p. 203; Beals, 1932, Table 79.

[43] Kroeber, 1932, p. 352, in reference to the Patwin, says, "Prisoners [taken in war], were tied to trees and shot with arrows." For the Northeastern Maidu, see Dixon, 1905, p. 207. For Mexico, see Beals, 1932, Table 130. The parallel here is with Mexico, although the intermediate Colorado River Yuma apparently practiced the Aztec-Pawnee-Natchez type of prisoner crucifixion and arrow sacrifice (Forde, 1931, pp. 168–169).

[44] Heizer and Beardsley, 1943.

[45] Fages, 1937, p. 70, "Those who die in war . . . are eaten by the relatives of the slayer." Here the parallel is again with Mexico rather than with the Southwest, although there is a single, otherwise unsupported statement by Alarcon, in 1540, who said of some lower Colorado River tribe: "They took out the hearts [of their enemies] and eate them and others they burned" (Forde, 1931, p. 165). See also Drucker, 1941, p. 223.

[46] Dixon, 1905; Spier, 1928, p. 290; Beals, 1932, Table 127.

[47] Kroeber, 1932, p. 376.

[48] Loeb, 1926, pp. 384–385, Pomo; Heizer and Hewes, 1940, pp. 591–592; Beals, 1932, Table 136.

[49] Kroeber, 1932, p. 411; Spier, 1928, pp. 290–291; Loeb, 1926, p. 379.

[50] Lowie, 1938; Parsons, 1939*a*, p. 215; Parsons, 1939*b*, Vol. 1, pp. 382–383; Barrett, 1908, p. 234.

[51] List from Loeb, 1926, p. 21, 133–134; Kroeber, 1928, p. 382; Loeb, 1932, p. 399; Kroeber, 1932, pp. 411 ff.

[52] Kroeber, 1928.

[53] Loeb, 1926.

[54] Spier, 1928, p. 270.

[55] Loeb, 1932.

[56] Kroeber, 1932, p. 419.

". . . at an early date, long before Pueblo cults had taken their specific form."

The Pomo-Patwin appear to have seized upon these stimuli of southern origin and incorporated them into a cult system, perhaps for the reason that they were so inclined and had sufficient surplus time, population, and subsistence margin to permit such preoccupation. In the absence of archaeological evidence for the north-central California cult system, there is no direct indication even of its antiquity as such.[67] The system may, theoretically, be of recent or ancient development, most probably the latter, in view of its high degree of internal integrative adjustment and refinement.[68]

Thus we may point to the California area as one which has for a very long time been receiving cultural influences radiating locally from the Southwest, influences which, however, ultimately represent the extreme northwestward extension of impulses radiating from the Middle American hearth.[69] Some of these influences, like the grooved stone ax, were originally derived through hand-to-hand trade transmission, while others, of nonmaterial nature, were probably dependent upon fuller acquaintanceship on a tribal, rather than individual, level. As to routes, we can only make general surmises, since former (postulated) continuous trait distributions now appear as interrupted due to interim loss or abandonment. Entering southern California from across the Colorado river, cultural influences from the Southwest appear to have travelled north along the coast and through apparently Pomo-Wintu-Maidu territory, for beyond this influence of the dynamic Northwest Coast pattern (here its extreme southern periphery) became dominant.[70]

[67] There is some reason to believe, from archaeological findings, that the "bird cult" is ancient in central California. Heizer and Hewes, 1940, pp. 591–592. In this regard, see also Kroeber, 1932, pp. 416–417.

[68] Drake and Cermeno recorded certain contemporary ethnographic Coast Miwok data in 1579 and 1595, and close inspection of their accounts leaves no doubt that the culture of that time was very closely comparable to the modern Coast Miwok. This is true of certain ceremonial performances presented by the Indians in honor of the English and Spaniards. Even though it be argued that 350 years is a brief span, it is perhaps significant that, at least for the part we can check, the present day content and configuration was then established. Heizer, N.D.

[69] For recent analyses of the problem of cultural contacts between the Southwest and Mexico, see Beals, 1943, and Haury, 1945. In this connection, Beals' suggestion of an ancient generalized "Greater Southwest" is stimulating. Drucker (1941, p. 227) would mark the southern limit of the Southwest at Rio Sinaloa on the coast, and just south of Cora-Huichol territory in the mountains.

[70] Kroeber, 1923; 1928, p. 389; 1932, p. 411. See MacLeod, 1929, for an extreme view on the northward diffusion of Middle American culture traits.

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THE MAZATEC CALENDAR

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IN THE chapter on the Mazatec language of his "Zentral-Amerika" Dr. Walther Lehmann mentions the fact that Dr. Wilhelm Baur had found the *tonalamatl* among the Mazatec Indians, but he did not give the names of the twenty days.[1]

During the months of January and February, 1936, while in Usila, a western Chinantec town, the junior author obtained information regarding a Mazatec calendar from Adalberto González, a native Mazatec from Huautla Jiménez. This informant remembered names of twelve months, and meanings of some.

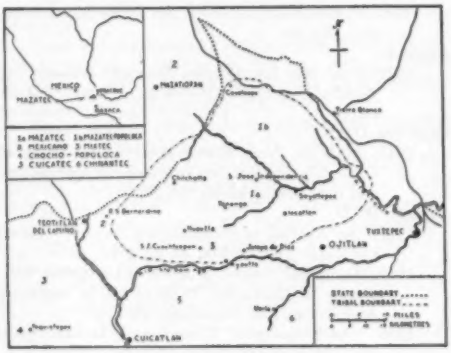

FIG. 23.—Map showing distribution of linguistic groups.

As the finding of only twelve month names suggested the possibility of a mere incorporation of the Christian months into the Mazatec language, the town of Huautla was visited during the month of April, 1936.

Huautla is situated at an altitude of about 5,800 feet on a mountain slope facing a wide valley which is intensively cultivated and in which are numerous coffee plantations. It is a comparatively large town, with about 17,000 inhabitants (in the Municipio), almost all of whom are pure Mazatec; over 80 per cent are monolingual.

The people seem prosperous and very industrious; they are intelligent and proud of their community, which impresses one as one of the best examples of Indian rural life in Mexico. Everywhere one may see the fine garments (*huipiles*) of the Mazatec women, and on market day, Sunday, the town is a riot of color.

The Mazatec language is part of a close-knit linguistic family which includes Popoloca of Puebla and Chocho and Ichcatec of Oaxaca.[2] The supposed relationship between Mazatec and Mangue-Chiapanec, as postulated by Brinton and Lehmann, seems to be quite distant, to say the least.[3]

Mazatec linguistic boundaries are indicated on the accompanying map (Fig. 23). To the north, around San José Independencia, there is a separate group called "Popoloca," whose language proved to be merely a subdialect of the Mazatec language. A distinction must therefore be made between Mazatec-Popoloca, Mije-Popoluca of Veracruz, and the better known Chocho-Popoloca of Puebla-Oaxaca.

In June and July, 1938, Mr. B. Bevan, the junior author, and Mr. J. B. Johnson spent four weeks in Mazatec territory. San José Independencia was visited, and there, as well as at Ixcatlan and Poza de Aguila, it was found that the calendar was also well known; in fact, an old informant at San José Independencia actually stated that he knew the *tiempos* better than the Christian calendar. Information was also gained here as to the meanings of two of the month names; in addition, a story of considerable mythological significance and a fund of information which led to the understanding of the several types of shamanism widespread in the region were collected.[4]

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[1] Lehmann, 1920, p. 903, says, "With regard to the folklore of the Mazatec, Dr. Wilhelm Baur has published in *Zeitschrift für Ethnologie* (Berlin, 1908, pp. 857–865) an article entitled 'Heidentum und Aberglaube unter den Maçateka Indianern.' It is to be greatly regretted that he does not mention the names of the 20 days in each of the 13 months and which are supposedly names after animals."

[2] Robert J. Weitlaner, "La Rama Olmeca del grupo Macro-Otomangue," *Segunda Reunión de Mesa Redonda, etc.*, Tuxtla Gutiérrez, pp. 33–35.

[3] Miss Florence Hansen and Miss Eunice Pike, both missionaries at Huautla, have kindly furnished us with a correct phonemic transcription of the month names, together with explanatory notes on the phonemic system of Mazatec. Both have an intimate speaking knowledge of the language and have for many years worked on the phonemic and tonal system of Mazatec.

The phonemic alphabet used in the tables is the same as the one approved by the Council of Indian Languages, Mexico City. Nasalization is indicated by: ą; ç is retroflex č; the tones are written: high ˊ; semi-high ˉ; semi-low (no mark); low ˋ.

[4] Johnson and Johnson, 1939*a*, 1939*b*.

TABLE 1

MAZATEC CALEN

I	II	III	IV	V	VI	VII	VIII	IX	X	XI
	VERSIONS OBTAINED FROM					TRANSLATIONS AND EXPLANATIONS BY INFOR				
Month Begins and Ends	J. Durantes Huerta	J. Garcia Huerta	J. Figueroa Huerta	Mauricio Vista San Jose Independencia	Rancho de Aguila	Hansen-Pike	J. Durantes Huerta	J. Garcia Huerta	J. Figueroa Huerta	Mauricio Vista San Jose Independenci
JAN. 1 -1- JAN. 20	Ẍomo	Ẍiąmo	chan moho	Čhianime		Čąmé	nahmę = madre del maiz		me = querer mas de querer	nàhmę́ = maiz
JAN. 21 -2- FEB. 9	Ẍant?au	Ẍiant?au	chan ndau	Čhia t?au		Ẍant?aù	nthaù = aire	aire	mas de viento	
FEB. 10 -3- MAR. 1	ČyąẌi	ẌiąẌi	chan shquihi	Čhią Ẍi	Čhią Ẍi	Ẍą́Ẍi	mas de cuentas	Ẍki = remedio Ẍki = numero	mas de cuentas o numeros que son las medidas del maiz	Tiempo que disminu
MAR. 2 -4- MAR. 21	ČyąKhui	ČyąKhui	chan cuihi	Čią Khui		ẌąKhui			mes variable	
MAR. 22 -5- APR. 10	Čyąhį	Čyąhį	chan yihin	Čhiahį	Čiahį	Ẍąhį́	nhį́ = sangre nthį́ = mazorca hį = 9	sangre	8	
APR. 11 -6- APR. 30	Čiahną	Čyąhną	chan nao	Čhiahno		Ẍąhnó		lechuza	hnó = tecolote	tiempo de maiz hnà = milpa hnó = Tecolote
MAY 1 -7- MAY 20	Čiato	Čyąto	chas tuhu	Čhia tò		Čątò		fruta = frutas	mas de las frutas (mangos, etc.)	Tiempo de fruta
MAY 21 -8- JUNE 9	Čumaho	Čiamaho	chan magcho	Čhiu maho	Čiamaho	Ẍąmáho		he = gordo mahé = gordando	mes del desarollo	trueno grande Ẍ?aǫ = trueno (Hrautia)
JUNE 10 -9- JUNE 29	Čumahti	Čiamahti	chan magtihi	Čhiu mashi	Čiamaši	Čąmahti	nhtii = tamal = tortilla de olla	hti = enojado	mes enojado porque truena en este mes	
JUNE 30 -10- JULY 19	sinda	sinta	sindaha	sinda		sinta		sinta = hacer	mes malo, no bueno	
JULY 20 -11- AUG. 8	sino	sinta	singha	sin?a	sind?a	sin?é	amarillo	amarillo	amarillo	sinę́ = amarillo
AUG. 9 -12- AUG. 28	Čyando	Čyanče	chandoo	Čhia?ando		cąXhoa	ando = largo Panda = gusano animal largo		mes largo	čindu = gusano
AUG. 29 -13- SEPT. 17	Čanče	Čokhwa	chant tahre	Čhiasthia	Čiathie	Čąnhtà		nthà = huaje	mes del huaje	tiempo de cosecha
SEPT. 18 -14- OCT. 7	ŽaKhwa	Čyanb	chan cuaha	Čhiakwa		Čąnče		dia Khwa = nombre de cierto quelite	quelite (?)	
OCT. 8 -15- OCT. 27	Časa	Čiasa	chan saha	Čhiasa	Čiasa	Čąsa		sa = crade sá = luna	mes del crecimiento	creciendo
OCT. 28 -16- NOV. 16	Čaki	Čaki	chan quihin	Čhiaki	Čiaki	Čąkí		čiKį = leña	mes de leña o escalera	čiKį = escalera čiKį = leña
NOV. 17 -17- DEC. 6	ŽaKhe	ŽaKhe	chan caan	ČhiaKha	ČiaKha	ŽąKhà		Khą = cosa quebrada	mes de actividad	Tiempo que pelea
DEC. 7 -18- DEC. 26	Kinda	Kinda	ganda caban	Kinda		Kintà			mes de las nubes	
DEC. 27 to DEC. 31	Kindaau	Kindaau	guinda aun	Kinda?ų	Kinda?ų	ŽąKiKintà?aǫ				

LENDAR

	XII	XIII	XIV	XV
NFORMANTS		AGRICULTURAL LABOR		
Vista Independencia	Rancho de Aguila	J. García Nanutla	J. Figueroa Nanutla	San José Independencia
maiz		empiezan a trabajar la tierra para sembrar maiz	rozando	no hacen nada
		sembrar maiz en tierra fria	preparan las tierras	cuando siembran frijol
disminuye	tiempo contado	sembrar maiz curando los granos con una yerba para que los gusanos no los coman.	siembras de temporal en Tierra fria	no hacen nada
	1	la mera siembra en nanutla 1	se siembra en tierra mas Templada. 1	no hacen nada
	tiempo de sangre	mero movimiento de siembra, haciendo la milpa en tierra caliente	siembran en tierra Templada.	van tumbando palo para rozar
maiz		limpiando la milpa, sembrando en tierra seca.	cantan los tecolotes última siembra en tierra caliente.	siembra Temprano maiz
fruta		limpiando y trabajando la milpa	milpa de tonamil	siembra Todo maiz
nde ano nautla)	tiempo grande 2	sale espiga, limpiando milpa, siembra de caña, café. 2	comienzan las aguas y verdazan los campos. 2	no hacen nada
	tiempo enojado	sale hilote, siembra de plantas.	Truenos, siembra de frijol	no hacen nada
	3	se sembra Todavia, Tiempo de lluvias, milpa hilo Tesando. 3	hay muchas enfermedades, comienza espigar el maiz.	siembra platano, caña, camote yucca, estamos en este tiempo ahora, mañana (June 27) hace 8dias que comenzo este tiempo.
arillo	tiempo de palabra	descansa la gente, macizando hilotes 4	la gente no trabaja, la mazorca Toma color (amarillo)	siembra café
sano	4	llueve mucho, Trabajo de casa, esta en color la milpa, doblandose la milpa	empiezan a pixcar en tierra Templada	riega semilla de picante
cosecha	tiempo de guajnicuil	pixcando	mero Tiempo de pixcar 5	cuando dobla la milpa, lo doblan para que no se pudra el maiz - como nace pasado year's amarillo - y no le caiga agua, lo doblan
	5	pixcando	sigue la cosecha.	solo pixcan
o	tiempo crecido	acaboron de pixcar, queda rastrojo	Terminan las cosechas de Temporal.	hagan mas semilla de picante
aleva a	tiempo de leña	siembran Tonamil en tierra caliente	se junta el rastrojo de las milpas	no siembra nada
e palea	tiempo rajado 6	siembran segundo Tonamil en tierra caliente 6	"actividad" porque se siembra Tonamil.	estan limpiando las plantitas de chile
		Tonamil en tierra caliente	mes de nubes en el horizonte	no hacen nada
	tiempo de cinco	se acaba el año.	5 o 6 dias.	no hacen nada, es el nacimiento del Señor

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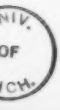


San José Independencia, Tenango and Mazatlán retain as many, if not more, vestiges of ancient beliefs. At Mazatlán, belief in dwarfs and gnomes is common, six kinds of narcotic mushroom are used by the local shamans, and divining with cards is practiced. Divining by corn-throwing was witnessed at Huautla.

The use and function of the Mazatec calendar are well known around Huautla, and it was possible in a few days to obtain several versions, one—in writing—by the municipal secretary of the town. His apparently inadequate transcription conveys quite satisfactorily the phonetics of the language.

It is regrettable that no information could be obtained as to the survival of the twenty day-names comprised in the tonalamatl, although many efforts were made to evoke the memory of informants to elucidate this point.

It is significant that at Jalapa de Díaz, a Mazatec town of the low country, the people remembered nothing of the old calendar months; they appeared to be unknown also at Mazatlán. This is a curious parallel to the limited distribution of the Chinantec calendar, which is used almost exclusively in the Lalana region but is either unknown or only fragmentarily preserved elsewhere.

It will be noticed that in one of the versions of the Mazatec calendar in Table 1 some of the names do not follow the same sequence as do those in the other versions, and have apparently been confused by the informant.

The beginning of the calendar year was placed on the first of January by all informants, no doubt as a concession to Christian influence.

To obtain a better perspective of the Mazatec calendar and of its relation to the Chinantec calendar, each has been arranged as a separate table. These can be shifted so that a possible coordination may become apparent.

THE MAZATEC CALENDAR TABLE

Column I gives the order and the dates of the beginning and ending of each Mazatec month within the Christian year.

Columns II–VII contain the versions as obtained from the five informants—namely, José Durantes, José García, and José Figueroa (secretario municipal) of Huautla; Mauricio Vista (secretario municipal) of San José Independencia; and an old man from Pozo de Aguila—and the version furnished by Misses Hanson and Pike. The twelve months obtained by the junior author in Usila have not been included in this series.

The prefixed particle *čiang, čą*, etc. is the equivalent of the Chinantec *hį* and means the season, period, or station of the year. Exceptions are the tenth, eleventh, eighteenth and nineteenth months, for which this prefixed particle is not used.

Columns VIII–XII give the informants' own translations of the month names. On the whole, Sr. Figueroa furnished the most complete and satisfactory data. In addition to the information shown in the table, a significant point regarding the fifteenth month was obtained. It was said that at this season the necks of the young men are stretched out—the men being lifted bodily by the head—to insure their growth, a tradition of interest in that similar rites were performed by the Aztec during the month *Izcalli*.

Comparison of the explanations and translations of Table 1 and Table 2 reveals numerous words common to both calendars—notably *Guajinicuil, palabra, creciendo, mentira-variable, trueno, fruta, doblado*, and *barriendo el aire*—the last-named is of special interest, since it is evidently related to the Aztec *Ochpaniztli*. In San José Independencia, however, a remarkable tradition concerning a month name still exists. The informant said, "There is a belief that at this time [the eighth month] there can be heard in the east every now and then, two or three times a day, a low far-away rumble like the rumble preceding an earthquake, and people say that where the sound comes from there sits an old woman upon the sea. She has big breasts and with them she feeds the cornfields, and it is when she is giving milk that the rumble is heard in the east and the leaves rustle. The old woman is called "Big Thunder" (č'iu mahę) . . . they pronounce it *č'ų he* at Ixcatlán. During the ninth month the old woman becomes smaller, and when they sow, the plants no longer grow big and the old woman continues to grow smaller and smaller."

Columns XIII–XV give, according to J. García and J. Figueroa of Huautla, and Mauricio Vista of San José Independencia, the agricultural labor performed in each month. The object of these columns is to show that, on the whole, the agricultural labor in the Mazatec area is very similar to that in the Lalana region of the Chinantla and hence provides a convenient basis for the coordination of the two cal-

endars. In Table 2, the agricultural activities are shown in the first column so that they may be easily compared with those of the Mazatec. Since we may assume that climatic conditions in the two regions are very much alike, it is possible, by sliding the two tables, to coordinate the two systems according to purely agricultural similarities. The numbered brackets indicate the main activities and seasons in each calendar, as noted at Huautla and Lalana, respectively. These are: (1) preparation of fields and sowing of corn; (2) the corn grows; (3) The rainy season; (4) the corn is ripe; (5) harvest; and (6) *tonamil*, or second crop.

We find that, with the above-named six basic divisions as a guide and with the first Chinantec month placed in line with the second or third Mazatec month, the two calendars are in close agreement in regard to rainy season, harvest, etc.

Since the first report on the existence of a Chinantec calendar appeared,[5] some additional information has been secured and, in view of the close relations which exist between the two systems, this has been incorporated in the second table.

THE CHINANTEC CALENDAR TABLE

Column I gives the agricultural labor performed in each month.

Column II gives the translations of month names and their explanations by the informants.

Column III gives one version of the month names in Chinantec—namely the second version obtained at Lachixola—as representative of the ten versions recorded in all.[6]

Column IV correlates the first and last days of each month with the Christian calendar, according to information obtained at Lachixola, Petlapa, and Teotalcingo.

Column V gives Brinton's versions of the Maya, Tzendal, Cakchiquel, and Chiapanec calendars;[7] each of these is indicated by its respective letter and month numbers (M = Maya, Tz = Tzendal, C = Cakchiquel, Q = Quiché, Ch = Chiapanec).

Without attempting a critical appraisal of Brinton's data, it is interesting to note that almost all of his interpretations find their equivalents in either the Mazatec or the Chinantec calendar. Of special interest in this respect is the Chinantec and Mazatec month *Guajinicuil*, with its close parallel in some of Brinton's versions. Among the words common to one or other of the calendars and Brinton's list may be mentioned *tecolote*, *amarillo*, *leña*, *humo*, *neblina*, *alacrán*, *fruta*, *petate*, and *cacao*, but in most cases, there is, unfortunately, no intelligible sequence and it would be difficult to reduce them to a system intelligible in itself or related to other calendars. It would seem that time, usage, and powerful Christian influences have wrought havoc with the old system—if such ever existed.

Discussion of the calendars automatically raises the questions: where is the center of their origin or diffusion, and what is the meaning of their survival? Among the many possible hypotheses, the following appear most pertinent.

(1) The two calendars are of purely agricultural origin.

(2) While, at the present day, only agricultural portions are in use, the calendars formerly possessed a mythological content.

(3) The calendars were borrowed, or, through diffusion from centers of higher culture, they found their way into the content of Mazatec and Chinantec cultures.

The peculiar linguistic and ethnic background of the Chinantec, Mazatec, and Chiapanec would seem to favor the first hypothesis, for these tribes appear to be descendants of a common ancestral stock, dislodged by Mayan, Zapotecan, and Nahuan occupations. Thus, one cannot very well dismiss the possibility that these two calendar systems are an archaic form of the Central American calendar complex, from which the more sophisticated mythological forms may have evolved later.

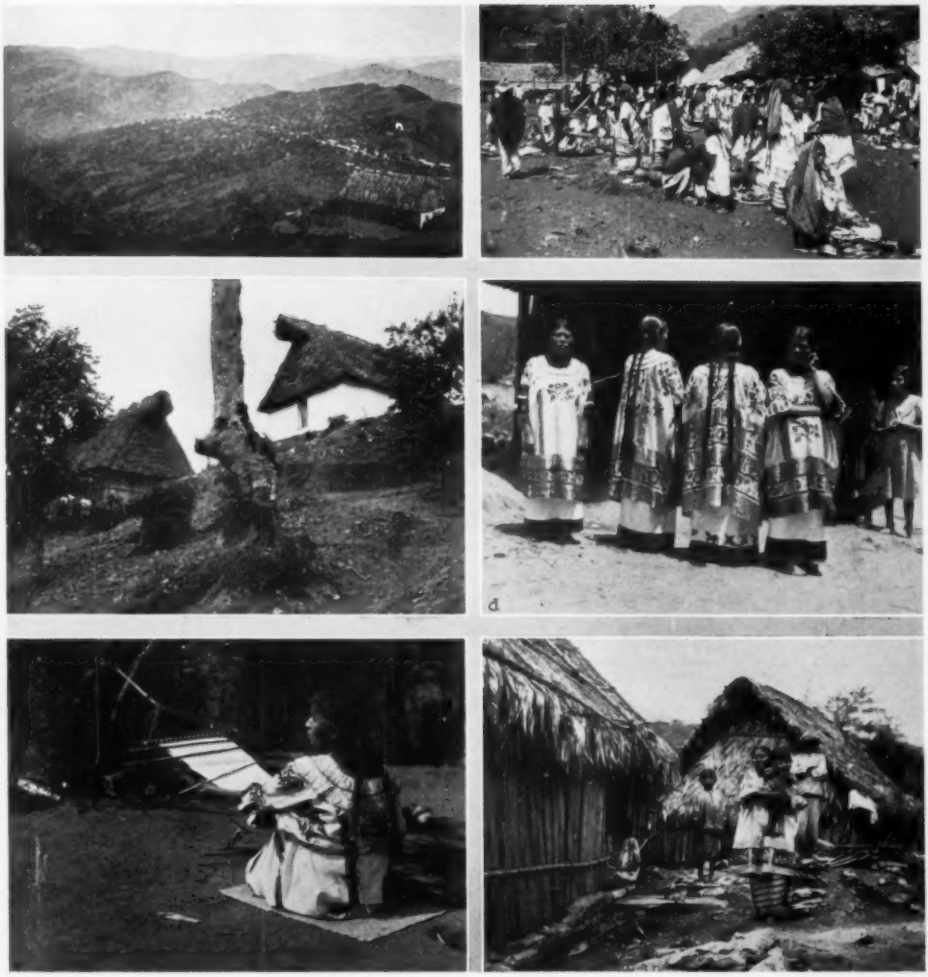
Against this hypothesis, it could be rightly argued that there are too many purely local and indigenous elements contained in the present-day form of these calendars to point to extraneous influences. These distinctive local elements, however, might easily have been superimposed later. It is more likely that the calendar formerly functioned as an agricultural and mythological whole, and that now, because of strong cultural pressure, principally Christian, only the portion pertaining to agriculture has been retained.

There is the further possibility that the two groups have borrowed, adopted, or received from the neighboring higher culture areas only the agricultural elements best suited to their activities. The fact that the Mazatec and

[5] Weitlaner, 1936.

[6] Tones have not been indicated in this list.

[7] Brinton, 1893.



The Mazatec. *a*, Huautla de Jiménez, center of the Mazatec, population 17,000; *b*, market at Tenango; *c*, house gables, Huautla; *d*, Mazatec costume, Huautla. The cotton *huipiles* are embroidered with flowers in brilliant colors, and decorated with blue, purple, or crimson ribbons. The skirts are of cotton homespun, with designs in dark red wool; *e*, Mazatec weaving; *f*, typical Mazatec *rancheria* of the *tierra caliente*, beside the Rio Santo Domingo, between Ayautla and Jalapa. (*a*, *b*, photos by B. Bevan otherwise photos by Weitlaner.)

TABLE 2

CHINANTEC CALENDAR

I Agricultural Labor (Abstract of all versions)	II Translations and Explanations by Informants	III Month Names (2nd Lack. Isola version)	IV Month Begins and Ends	V Brinton's Translation or Implication From Month Names In Other Calendar Systems
Tierra humeda, comenzan rozar	mes blandito, suave tierra, desarrollar	h_i ʔuɸ?	Feb 10 1 Mar 1	C VIII soft soil, blanda, latierra Q III muddy soil
rozar, siguen a rozar, tiempo de no sembrar, limpiar la milpa, flor de guajinicuil.	mes de guajinicuil	h_i ʃa	Mar 2 2 Mar 21	M XI white, Tz III white flower Q III white flower Q XV a tree with white flowers. C IX cacao harvest Tz X healthy winds arrive, Ch II, IV winds begin
Ardiendo la roza, se levanta la neblina de los arroyos, acaban rozar, tumbar árboles	hondura del río, paso o reposo (?)	h_i kaʃa	Mar 22 3 Apr 10	Tz III great white, Tz XI seed corn prepared. M XIII smoke in the air. C IX smoke, mist vapor. Tz IX plants attacked by diseases C X 4th cacao harvest, Ch III, XII mist, fog.
Tiempo muy cambiable, sembrar (en Tlatlacinga).	montira, angosta.	h_i hu	Apr 11 4 Apr 30	Ch IV cambiable, Tz VI planting corn.
mayo tiempo de sembrar milpa de Temporal, maiz, frijol, mero mes de sembrar.	palaperas, vestido de mujer, huipil	h_i hu	May 1 5 May 20	Q III word? Tz VIII planting corn.
pero llueve se queda la gente en casa, mero tiempo de sembrar	parado	h_i ŋɡ	May 21 6 Jun. 9	M IX brooding of birds, M XII deer, game, hunting C XIII season of birds, Tz VIII planting corn. Q XV season of birds.
frutas, piña, platano, camote, limpiar milpa, crece la milpa.	de bestia (caballo, mula) de agua, trucha o mula	h_i lo	Jun. 10 7 Jun. 29	M IX bat M XII deer, game, hunting. M XII to skin, dress animals? Tz IX plants attacked by diseases
crecen las milpas más y más, limpiando milpas.	ropa, enclenado, camisa o vestido de hombre	h_i Kua	Jun. 30 8 Jul. 19	C II flying insects.
llueve granizo, fruta, llueve mucho, no hacen nada, acabaron limpar, sale espiga y dan flor en el monte.	caido, cayendo	h_i lo	Jul. 20 9 Aug. 8	Tz XI flowering season, M XVIII noise like thunder Ch XIII nothing is done. C V louse Ch XIII fishing fish. Ch. XIII little fish. M XVIII jar, pot
sale espiga, todavia no crece (en Lachova) lamazorda se doblia por abajo, frijol en Petlapa y Lalana.	pesado, pesado el abate	h_i ʔi	Aug 9 10 Aug. 28	C IX chills, fever M XVIII to sing. Q II painted mat
la milpa esta alta, parada, la espiga, la mazorca hojosa, no esta pierna (en Lachova) doblando la mazorda, frijol en Petlapa y Lalana.	4	hondura, parado, ayer	h_i ʃa	Aug. 29 11 Sept 17
doblando la milpa empiezan pizcar.	5	doblado, mazorca.	h_i ʃiʔkuʃ	Sept 18 12 Oct 7
mes de sembrar pisanta y frijol, algodón, pizcar maiz.	raiz, sembrar.	h_i hmo	Oct. 8 13 Oct 27	M I mat, rag. C IX mats rolled up. Q II paints? mat, Tz X fence, cercado de palos. Ch I, V, chile.
siembra de frijol y camote, madurando la semilla, lloviznando, no trabajan.	agua, fruta o semilla.	h_i hmɔ	Oct 28 14 Nov 16	M VII rainy, cloudy, M XVI god of rain. M XII height of rain Ch X, XI camotes are planted. Ch VII rivers fill.
pasando primer Tonamil, tiempo de "atole" (verde) para los animales.	vomitar, asco, nuevo	h_i ayʌ	Nov. 17 15 Dec 5	Ch I, II camotes are planted. M XVIII jar, pot M IX scorpion C X 5th cacao harvest
trabajan segundo Tonamil, siembra de Tonamil.	camaron, espina, clavo, la cara del sol	h_i ʈanyi	Dec. 6 16 Dec. 26	M XVII maize like thunder C IV smoke, mist, vapor. Ch XI, XII mist, fog
camote, Tercer Tonamil, se acabó el trabajo, limpieza de casas y caminos.	maiz, el sol atiende el zenit, medio, centro	h_i taja	Dec. 27 17 Jan. 15	M X cleaning and renovation of temples C X, XI, camotes are planted
poco Tonamil, limpia de milpa, tiempo de frio animales y pajaros ha encuentran agua comer.	escoba, talle, raiz, barriendo el aire	h_i ya	Jan. 16 18 Feb. 4	M XVIII jar, pot C V lox Tz X fences, cercados de palos. Ch XII X cold. M X cleaning and renovation of temples
cielo nublado, no trabajan, no siembran, no crece nada, limpiando la milpa, (Tlatlacinga siembran)	oscura, entrando la noche 5 dias	h_i ʔnyɛ	Feb. 5 19 Feb. 9	M X scorpion M XII yellow sun. Ch XII nothing is done M XI end, conclusion.

Chinantec areas were subjected for a very considerable period of time to steady infiltration and strong influences from the Nahuatl and Zapotec would make the adoption of a calendar system from either one of these sources a purely expeditious matter. It can be readily seen how such a calendar would prove invaluable in seasonal activities. Furthermore, the use of the calendar in such a completely practical context would make the adoption of the twenty day names, with all their mythological subtleties, a secondary and unnecessary refinement, since only the month names would be essential.

Such an hypothesis, however, would not exclude the possibility that mythological concepts were simultaneously or later introduced, or that, when they were introduced, they were elaborated, changed, and fitted to their peculiar new cultural context and were finally submerged and lost under the flood of Christian influence. The marginal character of the calendar in both Chinantec and Mazatec peripheral areas would allow for such infiltration of mythological concepts.

Finally, it might be added that there exists the possibility that a *tonalamatl* still functions in some form in a remote corner of the Mazatec territory. Although so far no proof of its existence has been obtained, it should not be forgotten that Dr. Baur claimed to have knowledge of the twenty day names among the Mazatec of Huautla. If these day names exist or ever existed, this fact would imply that the calendar was ultimately of mythological character and more sophisticated than would appear from its present form and use. In this connection, although there is unfortunately no space here to discuss the relationship between the ancient calendars and those surviving among the Chinantec and Mazatec, attention should be drawn to the fact that, as already noted, not only many words, but also many basic ideas underlying those words are common to both Chinantec and Mazatec calendars and to the ancient Aztec, Chiapanec and Mayan.

A more detailed investigation into the working of the two calendars must necessarily take into consideration other agricultural systems such as those of the Tzendal, Cakchiquel, Quiché, and, especially, the Chiapanec. Unfortunately, this last calendar is known to us in so incomplete and distorted a form that very little assistance can be derived from it.[8] However, in view of the linguistic relationship which, remote as it seems, probably exists between the three groups,[9] it is this Chiapanec calendar which might be expected to come nearest to the above-mentioned systems.

Brinton long ago called attention to the agricultural character of the Tzendal, Cakchiquel, and Quiché calendars as contrasted with the Mayan, and he also noted that only the month names, not the day names, had been preserved, exactly as appears to be the case in our Chinantec and Mazatec calendars.[10] The three calendars mentioned by Brinton seem also to ocupy a marginal position with respect to the Mayan, just as the Chinantec and Mazatec calendars do with respect to the Zapotec.

It seems futile, however, to pursue this question further until we know more about the adjacent Zapotec, Mije, and Mixtec, among whom there is a slim chance that some barely surviving calendar system may be found.

[8] Becerra, 1933; Lehmann, 1920.

[9] Brinton, 1892.

[10] Brinton, 1893.

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FACTS AND COMMENTS

EMPIRICIST AND EXPERIMENTAL TRENDS IN EASTERN ARCHAEOLOGY

Several exceptions have been taken recently to the use of "guess dates," assumptions, hypothetical sequences, the theory of cultural continuity, and other concepts in eastern and middlewestern archaeology.[1] These criticisms lay bare a division of opinion on several fundamental issues of method and theory, and it is the purpose of this communication to shed some light on the conflicting views.

We may at the outset indulge in some labelling, not for purposes of name-calling, but to provide handles for verbal manipulation. It is the opinion of the writer that two trends in method and theory can be distinguished: one we may call "empiricist," the other, "experimental." Reasons for the choice of these rather mouth-filling terms will subsequently become clearer. Also note we do not use the word "school"; this term implies a company of individuals, all subscribing to a special dogma, whereas the contemporary trends actually crosscut several "schools" in archaeological thought. In many cases, individual archaeologists exemplify both of these trends in their own work.

First, empiricism. The more or less orthodox formulation of this point of view has been made recently by Wedel:

> . . . I hold that, whatever its ultimate goal, archaeology can progress surely only as its practitioners adhere to the method and attitude of science—in essence, the acceptance of observed and verifiable facts, the eschewing of unsupported speculations and personal dicta, and a circumspect tolerance of that for which the observational, experimental, or experiential evidence is not immediately at hand.[2]

It is reasonably clear from the above quotation why the particular trend it is chosen to exemplify is called "empirical." The logical implications of this statement are: (1) that "fact" is a phenomenological datum, i.e., it exists; (2) that it is possible to verify or establish, beyond all shadow of a doubt, such facts; (3) that any statement, however general or specific it may be, if not supported by verifiable facts is unscientific, and, if not to be rejected, at least handled with the utmost suspicion.

It is further held or implied by those who tend to fit into this trend that archaeology, of all "sciences," must guard against speculative theory and imaginative hypotheses, since archaeology is the most profoundly "historical" science of all, the discipline in which conclusion is most closely bound to the actual perceptible, touchable, countable evidence. Manifestations of this point of view take their most developed form in statistical ceramic analysis, stratigraphic presentation, or the location of an archaeological site, beyond all possible question, in an historically documented position. There seems to be an identification of "fact" with "artifact."

The development of this empiricistic trend is to be traced ultimately to the beginnings of American "historical" anthropology, particularly the interest in trait-list analysis and historical reconstruction culminating in the trait-element studies of Kroeber and associates. Again, as in historical ethnology, these empirical studies were in a certain sense a reaction against the earlier, chiefly nineteenth century, speculative archaeology and anthropology. A review of the original papers on the Midwest Taxonomic System establishes fairly clearly the almost crusading spirit of this trend: the desire to place archaeology on a scientific footing, on a sound, painstaking, cautious basis.

There is no question whatever about the necessity for sound empirical techniques in archaeological analysis. The whole aspect of archaeology which deals with reconstruction of site history, ceramic traditions, architectural complexes, or ethnohistorical relations must be, from the standpoint of *technique*, profoundly close to the actual available data. With this general position there cannot be any argument. The difficulty appears when adherents of the empiricistic view draw certain conclusions from their techniques and assume these also have applicability for general *methodology*. The distinction will become clearer in the discussion to follow.

Secondly, the experimental trend. The writer has been unable to find a quotable statement with succinctly outlines this point of view. We shall synthesize one on the basis of our general acquaintance with the field:

Whereas the empiricistic trend leans heavily upon concepts of classification and typology and procedure developed in the biological sciences, the experimentalist point of view tends in the direction of the logic and method of the physical sciences. We do not imply this is a conscious or deliberate difference, but merely a difference in scientific atmosphere and methodological orientation. The difference may be dramatized in terms of single words: while the empiricists are concerned with *fact*, the experimentalists are concerned with *problems*.[3] In the experimentalist view, "fact" becomes a strictly relative concept, as does "trait," the emphasis being placed upon the manipulation of traits and archaeological facts in the light of hypotheses, the definitions of what constitute fact or trait varying as the problem itself varies.

Correlatively, "verification" is a purely relative concept. For certain problems, verification is accomplished by numerical majority, for others, a single case may be sufficient. The point of difference between this flexible concept and the definition held by the empiricists lies in the latter's tendency to place the process of verification completely outside of the data, to view it as an absolute logical means of discovery which, quite independent of the subject matter, reveals truth. The experimentalist point of view holds that verification is merely an operation which obtains its value from the data itself. Or to transform the equation into probability terms: the experimentalists distinguish between *verification* and *proof*, assuming that nothing in culture can be *proved*, beyond all shadow of a doubt, but that it is possible to establish varying degrees of probability.

All this is very general, and should be pinned down to more concrete terms. As an initial example, we may take up the matter of chronology. Contemporary language distinguishes between "absolute" and "relative" dates and dating techniques. The former are those which have an actual numerical denotation, the other, those which are less precise, or which "date" a site horizon in relation to some other horizon, neither being calendrically determined. In

[1] E. g.: W. Wedel, "On the Illinois Confederacy and Middle Mississippi Culture in Illinois," AMERICAN ANTIQUITY, Vol. 10, No. 4, 1945, and A. J. Waring, Jr., "The De Luna Expedition and Southeastern Ceremonial," AMERICAN ANTIQUITY Vol. 11, No. 1, 1945.

[2] Wedel, *op. cit.*, p. 386.

[3] *Cf.* C. Kluckhohn, "The Conceptual Structure in Middle American Studies," *The Maya and Their Neighbors*, N. Y., 1940.

the view of the empiricists, the absolute dates are the "real," the "factual" dates, the relative are only "guess dates," "hypothetical dates." The experimental approach, on the other hand, is fertile in the use of relative chronologies.

On this question of dates both trends have something in their favor, both have erred. The empiricists ignore two things. In the first place, many of the so-called "absolute" dates, e.g., dendrochronological dates, have no greater degree of probability than the so-called "guess dates." This obviously does not hold true in the Southwest, but it is certainly the case elsewhere. It does not seem possible that dendrochronology in the Middle West can ever achieve more than a date with a wide plus-or-minus-so-many-years margin, or a mere indication of two or three possible and equi-probable year sequences into which the chart in question may fit. Such "dates" may be no more and no less probable than a carefully-developed ethnohistorical or comparative-archaeological "guess date." The expression of the former as numerical year-symbols does not "verify" them to a much greater degree than the carefully built-up and critically handled inferential materials. Thus, by comparative methods we can "date" a Middle Mississippi site as "early fifteenth century," and give this arbitrary date-symbols, say 1600–1650. The dendrochronologist might arrive at the following conclusions: "the chart from specimens found at this site agrees with a certain 1595–1645 sequence in the master chart, with a probability of about 65%." It is believed here that the two statements have approximately equal probability. In certain horizons, and with certain types of evidence, one might actually feel inclined to place more trust in the comparative chronology than in the tree rings.

In the second place, while it is freely admitted here that tree rings must and should be used wherever possible, it is also submitted that there are localities and conditions where they can never be used, or used to a limited degree only, and in these cases other methods of dating must be accepted as reliable and, to a degree, verifiable. And in many cases, such dates are fully as "factual" as the absolute variety.[4]

When one leaves the chronological range of possible dendrochronological and ethnohistorical dating, it is literally anybody's guess. The writer is exceedingly skeptical as to the possibility of ever dating Hopewellian by "absolute" means; this implies that all we can do is throw the field wide open to every theorizer who thinks he has some line of evidence or a plausible argument. Keeping one's "guess date" locked up in the desk drawer until it is "verified," or tested by "observation, experience," etc., will never solve problems.

So much for the logical difficulties of the empiricists. The experimentalists must shoulder the blame (and the writer includes himself) for the "irresponsible use"[5] of inferential dates without clearly and unmistakably designating them as such. By this we mean that the inferential dates themselves have been released and discussed before the research behind them—and there *is* research behind them—has been published. Secondly, too much attention has been given to the date-symbols and not enough to the fact that they are merely hypothetical tags which denote a relative, extended, chronological bracket, a probable sequence determined from the pursuit of several independent lines of evidence. Third, we have been much too willing to apply guess dates to exceedingly remote horizons (pre-Hopewellian), where a strictly relative-symbolic denotation is preferable at this stage of research.

Ethnohistorical reconstructions constitute further examples. The empiricistic point of view rejects a hypothetical or inferential ascription of a particular historic or protohistoric culture to a tribal entity, preferring to wait until all the verifiable facts are at hand. This view assumes that facts can actually be obtained; it is the experimental view that in many cases they cannot ever be. In such cases, an inferential, comparative ascription must be accepted as probable. And such a probable statement must be used in further calculations as the historical reconstruction is extended. This technique can be abused, of course—but it must not be ignored. To ignore it is to place a block in the "road to a meaningful, comprehensive, and trustworthy historical reconstruction and interpretation."[6] Wedel and others are correct in believing that the technique has been misused, but one feels that they may be in danger of throwing out the baby with the bath.

To pick a case at random, the Oneota culture, by comparison with stratigraphically and typologically earlier and later horizons, can be inferentially placed within a specific relative time period. The various lines of evidence going into this demonstration are such that the probability of this "date" is almost beyond question, or at least is extremely high, so high that if dendrochronological dating becomes possible, it will very likely only confirm the inferential dating. Quibbling over differences of from ten to fifty years in this period are quite beside the point; the inferential-relative dates do not pretend to offer an absolute numerical denotation. The same argument holds for Waring's objection to the phrase "post-1540"—this is not meant literally as "any year subsequent to A.D. 1540," but is only a symbol for a general period in the middle and latter part of the sixteenth century which contains within it an historical event, the De Soto expedition, which can be used as a sort of sign post.

Similar arguments hold for the ethnohistorical identification of Oneota; while it may well be that not *all* Oneota foci or sites were Chiwere Sioux, a great number undoubtedly were, and the probability that those which cannot be positively identified were also members of some Siouan group is very high. Simply because we cannot absolutely identify each and every site as a member of an ethnic group does not mean that we must reject the method of inferential reconstruction. The essential point is that the Oneota culture, as a universe, is structurally so constituted and so corresponds in time and place with another universe, certain Siouan groups (both universes being relatively homogeneous), that the identification of a very few sites makes the whole inferential relationship highly probable. This fact should not be construed as discouragement to further historical research in order to identify additional sites; on the contrary, it should act as a highly stimulating hypothesis for more research. *But*, the "hypothesis" has *already* proved, or rather verified, something; it is not to be rejected because all the evidence is not at hand.

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[4] Empiricists sometimes object that "guess dates" "get into the literature" and become fixed. This is an indictment of the lack of perspective among archaeologists in viewing their concepts as immutable, and is not an accusation of inferential dating as a poor method. Science, like the rest of culture, changes, and, as individuals, we must be more willing to recognize change. Current views only reflect certain structures in our socio-psychological makeup (prestige, etc.), and are not necessarily inherent in scientific activity.

[5] Waring, *op. cit.*, p. 37.

[6] Wedel, *op. cit.*, p. 386.

Another example can be found in the large corpus of archaeological interpretation and assumption which has been built up on the basis of some pure speculative hypotheses—hypotheses which have never been verified, but which relate to a universe of data which is so structured that these hypotheses are extremely plausible. McKern's hypothesis of an Asiatic origin for the "Woodland pattern" (principally pottery) is an excellent example. Nobody has proved it, but the writer feels secure in saying that practically everybody accepts it. This hypothesis is also an example of one which could be verified by a very few cases—a large numerical majority would be desirable, but not mandatory for verification. Somewhat similar is the case of the famous Lothrop-Valliant "Q Complex"—never "proved," and not likely ever to be, yet highly probable in its implications. One wonders where American archaeology would be today if such hypotheses and "hunches" had not been aired.[7]

Empiricist suspicion has also been cast upon the tendency toward the interpretation of archaeological materials in terms of a particular theory of cultural dynamics. Griffins postulate of cultural continuity in Eastern archaeology is a case in point, the writer's own meager effort at a functional analysis is another. Let us grant immediately that the traps and pitfalls in such interpretations are many, but again the progeny must not be eliminated in the process of getting rid of the bath water. The fact is that the theory of continuity agrees in the main with everything we know about the nature of cultural development in primitive and modern society, and until the empiricists can demonstrate otherwise, it may be accepted as a working hypothesis. Similarly, the folk-urban classificatory theory of culture permits inferences about the meaning of archaeological remains because it assumes that culture objects have some structural relation to the culture and society producing them. It would be quite impossible to prove this latter hypothesis conclusively, yet it relates to a universe containing certain uniformities which render it extremely probable.

Empiricist rejection of these theoretical approaches must not be phrased as accusations of their unsound nature, but rather in the form of explicit critiques of the theories themselves and their specific applications.

Hypotheses—not "observable, verifiable fact," or classifications—are the life-blood of any science. What constitutes a fact or a classification is a relative affair, determined entirely by the problem at hand. Because archaeology deals to a great extent with sense-perceivable data, i.e., artifacts, documents, etc., it does not necessarily follow that archaeological method should be confined to the "Baconian observation" of empirical detail. Archaeological classifications and typologies are abstractions which are really bundles of testable hypotheses about the nature of correspondence of culture objects to the dynamic culture-historical pattern which bore them. The prominent biological emphasis in archaeological taxonomy has to a very great extent obscured this point, and it has been only recently, with the growing interest in ideal types and other hypothetical constructs,[8] that archaeological method has been given new life.

[7] "The history of science shows beyond doubt that the vital factor in the growth of any science is not the Baconian passive observation but the active questioning of nature, which is furthered by the multiplication of hypotheses as hypotheses." Morris Cohen, *A Preface to Logic* (N. Y., 1945), p. 7.

[8] Colton's "analogous types," Rouse's constructed chronologies and "modes," Willey's ceramic "traditions," and the levels within the Midwest Taxonomic system are all examples.

It should be reiterated that most archaeologists accept parts of both the empiricist and experimental approaches. Wedel, for instance, although cited here as an adherent of the empiricist trend, has nevertheless in his own work—notably his researches on Lower Mississippi—had recourse to imaginative hypotheses and inference, and has built reconstructions upon them. Waring also has pioneered in functional interpretation in regard to the Middle Mississippi religious cult. Griffin, an exponent of the experimental point of view, has presented archaeology with some meticulous and searching empirical studies. In the long run the difference would seem to be not so much a matter of specific research projects, but rather of the fundamental scientific outlook.

The central point of controversy revolves around the meanings, and correlated methods, of such terms as "trait," "history," "type," *et al*. As indicated earlier, the experimentalist view accepts such terms as purely relative to the data,[9] while the empiricists assume an absolutist referent. From this standpoint, the division of opinion only reflects the basic dichotomy in all American anthropology: the "historical" emphasis upon the collection of data and on limited generalization, and the newer interest in process, hypothesis, and theory. This latter development, in part, has been a recognition of the faults in the overly eager total rejection of nineteenth century evolutionary anthropology.

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[9] *Cf.* J. W. Bennett, "The Development of Ethnological Theory as Illustrated by Studies of the Plains Indian Sun Dance," *American Anthropologist*, Vol. 46, No. 2, 1944, pp. 176–179.

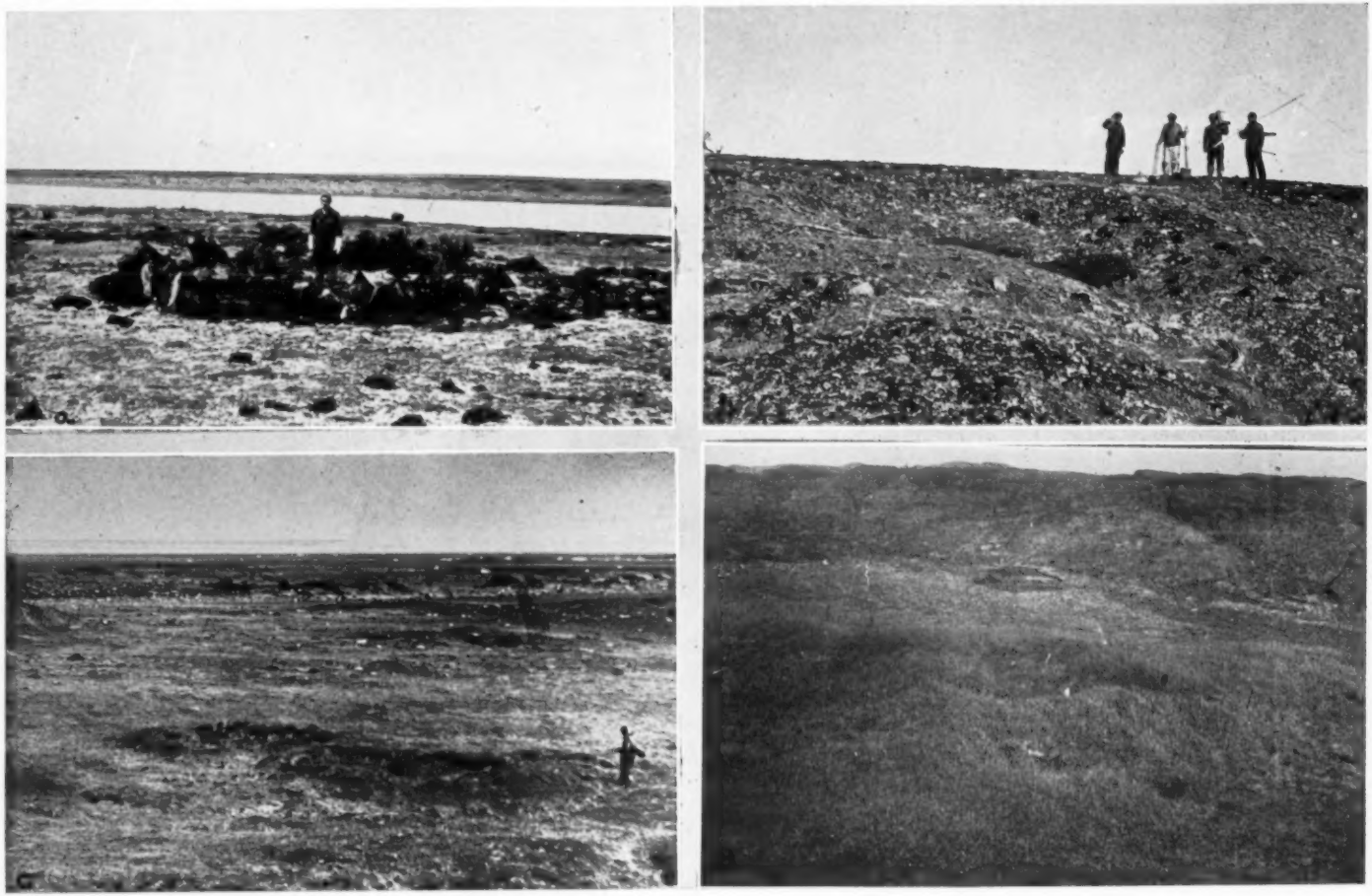
A STONE EFFIGY FROM LONG ISLAND

In 1940, at Great Neck, Long Island, Mr. Calmer Forsander found a waterworn glacial cobble with a crudely executed face on one side in an old stone wall bordering his property. Mr. Forsander knew that I had excavated the Baker Hill site,[1] located about three hundred yards west of his house, and brought the find to my attention.

The specimen is roughly egg-shaped and is composed of a crystalline material which appears to be indurated sandstone (Fig. 24). It measures approximately 15 inches in length, 11 inches in width, and 10 inches in thickness. On one of the broader sides is a face, pecked and ground into the surface. The workmanship is crude and resembles that found on the pitted hammerstones common in the region. The eyes and nose are represented by three roughly circular, shallow depressions. A rather faint vertical groove crosses each of the eyes, causing them to appear slightly elongated. A third vertical groove runs along the right side of the nose and the inner edge of the right eye. The mouth is portrayed by a broader, shallow, horizontal groove. From the lower edge of this groove, five narrow and deeper grooves radiate downward and outward. The upper portion of the features is encircled by a groove starting at the level of the mouth on either side of the face and curving upward around the eyes. The workmanship on the long encircling groove is comparable to that found on a crude stone ax or maul.

The occurrence of the face motif in various forms on stone as well as on other materials, notably pottery, has

[1] Carlyle S. Smith, "Clues to the Chronology of Coastal New York," AMERICAN ANTIQUITY, Vol. 10, No. 1, 1944.



Hudson Bay. *a*, a "strong" tent ring on Driftwood Island; *b*, a hollow indicating a house ruin near the top of the western Marcopeet Island; *c*, house ruins on Kidney Island; *d*, house ruins on Howe Island.

been discussed by many writers. Ritchie,[2] for example has described faces occurring on clay pipes in the Castle Creek focus of the Owasco aspect. It is not my intention in this brief paper to consider every reference to finds similar or related to the specimen discussed here. I wish, rather, to present the specimen as evidence which may be used in the further study of this trait.

To my knowledge, the face has appeared at three other sites on Long Island. The Dosoris Pond site, excavated by Harrington[3] and included in my time scale for western Long Island,[4] produced a collared rim sherd of the castellated type bearing an incised design and three punctates arranged in such a way as to suggest a face. This site is assigned to the latter part of the Clasons Point period, which runs from the late prehistoric into the historic period. A pipe fragment bearing a human face is reported from the Port Washington site investigated by Harrington.[5] The site dates from the earlier part of the Clasons Point period.[6] The Wilkins site[7] produced a sherd bearing

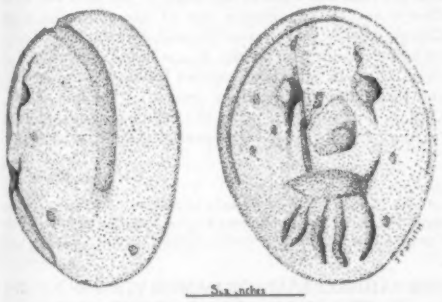


FIG. 24.—Stone effigy from Long Island.

several nodes around the rim; each node bears a face formed by three punctates. Some of the materials from the Wilkins site may have been intrusive inasmuch as all the humus had been removed in grading operations. It is assigned to the Grantville period, which terminated when Castle Creek influence introduced the collared rim and other changes took place in the ceramics.

No other archaeological evidence was found in association with the stone specimen described here, and it is likely that the stone was carried some distance before it was incorporated in the stone wall. The wall appears to have been part of the fence system of the Baker Farm, which, according to local tradition, was established during the seventeenth century. When the nearby Baker Hill site was excavated the remains of another stone wall were encountered; in it were several large stones which appear to have been used by the aboriginal occupants as mortars and anvil stones. The workmanship of the pecked and ground hollows in these stones resembles that of the marks on the stone face. The pottery from the Baker Hill site has been placed in the latter part of the Clasons Point period[8] and shows a strong influence from the Iroquois aspect. A fragment of a clay pipe bowl was also found here. Unfortunately it came from the front part of the bowl; the shape indicates a type of pipe found on Iroquoian sites, where such specimens often have a human face on the stem side of the bowl.

While the proximity of the stone specimen to the Baker Hill site is no indication that it belongs to the same horizon, it may have some significance in view of the general association of the face motif with late manifestations in the region. The one exception is the occurrence of the punctate faces on the sherd from the Wilkins site of the Grantville period. The disturbed nature of this site, however, casts some doubt on it as evidence for the presence of the trait in the earlier period. Thus far the evidence seems to indicate that the use of the face motif is a trait of the Clasons Point period on Long Island.

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Hudson Bay. *a*, a "strong" tent ring on Driftwood Island; *b*, a hollow indicating a house ruin near the top of the western Marcopeet Island; *c*, house ruins on Kidney Island; *d*, house ruins on Howe Island.

[2] William A. Ritchie, *The Pre-Iroquoian Occupations of New York State*, Rochester Museum Memoir, No. 1, 1944, p. 57.

[3] Arthur C. Parker, *The Archaeological History of New York*, New York State Bulletin, Nos. 235, 236, 1920, pp. 346–348.

[4] Smith, *op. cit.*, p. 90.

[5] M. R. Harrington, *Ancient Shell Heaps near New York City*, Antaropological Papers of the American Museum of Natural History, Vol. 3, 1909, p. 177; Alanson Skinner, *Archaeology of the New York Coastal Algonkin*, Anthropological Papers of the American Museum of Natural History, Vol. 3, 1909., p. 224, Fig. 36*b*.

[6] Smith, *op. cit.*, pp. 91–92.

[7] Smith, *op. cit.*, pp. 92, 93.

[8] Smith, *op. cit.*, p. 91.

RUINS OF ESKIMO STONE HOUSES ON THE EAST SIDE OF HUDSON BAY

Archaeological material obtained from Eskimos on the east side of Hudson Bay has been described by Mathiassen,[1] Quimby,[2] and Jenness,[3] but no systematic excavations have been made in the area. Mathiassen[4] was told by Mr. S. Berthé of Reveillon Frères that there were house ruins of turf and stone on the east coast of Hudson Bay at Kovik Bay, Mosquito Bay, and Cape Dufferin, and also on the Ottawa Islands; and by Mr. Perdy of the Hudson's Bay Company that there were house ruins at Cape Wolstenholme and many around Port Harrison. Obviously, Mathiassen concluded that these were regular houses of the Thule type. Quimby[5] found only oval and rectangular tent rings on the Belcher Islands, and assumed that the semi-subterranean houses characteristic of the Thule culture were lacking.

While doing work for the Geodetic Service of Canada on the King George, Ottawa, Sleeper and Marcopeet islands, I found a total of one probable and four definite village sites consisting of houses similar to those of the Thule culture which I had seen on Melville Peninsula and Southampton Island. Since only nine landings were made and the walks taken were comparatively short, it seems likely that ruins of old stone houses are numerous on these islands. The position and the condition of the ruins are described below.

Driftwood Island, King George Islands. Here I saw what I thought was a house, but it was so old that it was scarcely distinguishable from a natural hollow and rock formation. Two miles east of the southwest point of Driftwood Island is a good harbor marked by a Geodetic Service tablet and an eight-foot rock beacon. The feature which I supposed to be a house can be found by walking eastward along the shore one mile from this harbor to a small bay filled with piles of kelp which is situated just before a ridge on which

[1] Diamond Jenness, "An Archaeological Collection from the Belcher Islands in Hudson Bay," Annals of the Carnegie Museum, Vol. 28 (1942) Art. XI, pp. 189–206, Pls. XIV–XXII, 1942.

[2] Therkel Mathiassen, *Archaeology of the Central Eskimo*, Report of the Fifth Thule Expedition, 1921–1924, Vol. 4, Pts. 1, 2, Copenhagen, 1927.

[3] G. I. Quimby, "The Manitunik Eskimo Culture of East Hudson's Bay," AMERICAN ANTIQUITY, Vol. 6, No. 2 (1940), pp. 148–165.

[4] Mathiassen, *op. cit.*, Pt. 2, p. 140.

[5] Quimby, *op. cit.*

are numerous small beacons and rock structures, then turning inland up a grass valley for about a quarter of a mile. The house will be found in a patch of tall, coarse grass beside a small, shallow lake. A kayak stand is close by.

Husky Island, King George Islands. There are four or five definite house remains near the top of the narrow isthmus at the extreme end of the long bay on the north side of this island. All that remain of these houses are small, regular depressions in the gravel. The break in the circular outline where the entrance once stood identifies them as houses.

Kidney Island, Sleeper Islands. There are five houses at the head of an intricate pattern of shallow bays along the

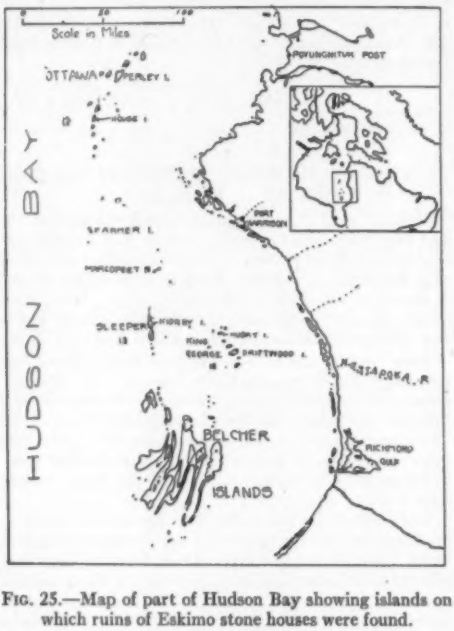

FIG. 25.—Map of part of Hudson Bay showing islands on which ruins of Eskimo stone houses were found.

east shore three or four miles south of the Geodetic Service tablet and beacon which are near the north end of this island. A few hundred yards behind the houses is the north end of a rather prominent ridge. If Kidney Island is approached from Beach Island, the houses will be found by passing between two small islands about three miles off shore. The houses are very old, but, since the ground is free from gravel, their structure is clearly apparent.

Marcopeet Islands. There are four or five houses on the most western Marcopeet island about a quarter of the way from its eastern to its western extremity. These houses appear to be of about the same age as those on the Sleeper Islands and are easily recognizable, although their structure is not quite so distinct, owing to the different terrain.

House Island. On the south shore of this island a small bay faces the northwest corner of the island lying to the south. There are five houses among some long, coarse grass about halfway between the head of this bay and a small lake. This group of houses is probably not over three hundred years old and is certainly much more recent than the other houses described above. A few walrus skulls near the houses may date from the time of occupation.

When I was on Driftwood Island I asked the Port Harrison Eskimos who were with us if they knew of any old houses. One man said he did and took me to some "strong" tent rings. They called these *iglunivik*, "old, or dead houses" as distinct from *tupekvinik*, "tent rings," and appeared to know of no other type of house ruin. It was only on the western Marcopeet island that I was able to point out houses of the Thule type to these Eskimos. They all declared that these were not houses. This suggests that if any houses occur on the mainland they must be too old to be recognized by Eskimos not familiar with fresher ruins in other regions. It is unfortunate that time did not permit me to show the houses on House Island to the Eskimos, as they could not have failed to recognize these as human dwellings and more definite information might have been obtained on the existence of similar ruins on the mainland. One old Harrison Eskimo has wintered on both the King George and Ottawa islands, but of late years the King George, Sleeper, and Ottawa islands have been visited only by natives hunting for walrus. It is seldom that they call at more than four or five well-known harbors in the islands, and their knowledge of these groups is therefore scanty. Captain W. Coats,[6] writing in the middle of the eighteenth century, refers to the Eskimos swarming on these islands.

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[6] John Barrow, Ed., *The Geography of Hudson's Bay; being the Remarks of Captain W. Coats in many Voyages to that Locality between the Years 1727 and 1751.* Hakluyt Society, London, 1852.

THE SADIRON LAMP OF KAMCHATKA AS A CLUE TO THE CHRONOLOGY OF THE ALEUT

Recent studies of trait distributions by Collins,[1] de Laguna,[2] and Heizer,[3] have, in my opinion, demonstrated a cultural connection between southern Alaska, the Aleutian Islands, Kamchatka, and Kurile Islands. These circum-North Pacific cultural connections seem to have been established after settlement of all the areas mentioned and therefore are not properly a part of the problem of man's first entry into America.

Southern Alaska, the Aleutian Islands, Kamchatka, and the Kurile Islands form a zone or rim around the North Pacific shores of Asia and America. Along this rim of the North Pacific there seems to have been a drifting of traits and trait complexes, both from America to Asia and from Asia to America. And for the most part, the cultural connections of the circum-North Pacific zone seem to have been rather independent of the diffusions and cultural development of the Bering Strait region.

Among the many traits and trait complexes common to the circum-North Pacific zone is the sadiron-shaped lamp of stone.[4] Although no two sadiron lamps are exactly alike, all are easily classified, because they are so similar. The lamp style or type is distinctive in exactly the same way that a pottery type is distinctive. And the cultural trait—

[1] Collins, 1937, 1940.

[2] de Laguna, 1934, 1940.

[3] Heizer, 1943.

[4] Dr. de Laguna, 1940, includes the sadiron type of lamp in a much broader class which she calls "pointed oval lamps." Although such an inclusion is perfectly valid, I find it more fruitful to keep separate the various kinds of "pointed oval lamps," of which the sadiron lamp is one.

sadiron lamps—is a convenient abstraction which represents a class or type composed of unique objects, namely, individual sadiron lamps.

The sadiron lamp is low and narrow with a triangular outline. The bottom is flat and the cross section is rectangular or trapezoidal. The oil reservoir is triangular in outline, shallow, and has thick straight outslanting or straight vertical sides which are flat or slightly rounded at the top. The apex of the triangular reservoir is rounded in varying degrees and sloped to make a wick ledge. Sometimes the floor of the reservoir is slightly inclined, presumably to provide for the flow of the oil or melted fat toward the wick. The lamp is well made. All surfaces are ground smooth, and the execution is, in general, superior to that of some other styles which are represented by more specimens.

The sadiron type is part of a lamp complex which occurs particularly in Kamchatka and the Aleutian Islands. This complex is found also in the other areas of the Pacific rim, but it is definitely lacking in the Bering Strait region of Asia and America. Both Collins[5] (1937, p. 376) and de Laguna[6] have discussed the genetic relationships of this lamp complex. Collins[7] believes that it probably crossed from America to Asia by way of the Aleutian Islands. But de Laguna[8] suggests that it came from Asia to America by way of the Aleutian Islands. I suspect that this lamp complex of de Laguna is too inclusive and abstract for the level of operation with which I am here concerned. As a whole, her complex includes types which may have had different histories. However this may be, the evidence of a genetic relationship among the sadiron lamps of Kamchatka and the Aleutians seems unmistakable. And I accept Collins' hypothesis that this form diffused from the Aleutians to Kamchatka.

In geographically contiguous areas genetically related traits should possess approximate contemporaniety. This is a basic assumption in the process of cross-dating traits or objects. Of course, the process is subject to considerable error because of such unknown factors as rate of diffusion, exact time of contact, variable age of trait or object in the contexts under consideration, and variable persistence of trait or object in the contexts considered. Because most of these variable factors are generally unknown in a given instance of cross-dating, the contemporaniety must be considered an approximation. Yet such approximations are extremely useful when better methods of dating are lacking.

The sadiron lamps of the Aleutian Islands and Kamchatka can be loosely dated by means of Japanese coins of the eleventh century A.D. Jochelson, who excavated a number of pit houses near Kuril Lake in southern Kamchatka, states "In the excavations in many pits [pit houses] on the shores of the Kuril Lake, I found brass coins of the eleventh century [A.D.], according to the decision of Professor Koganei, to whom I showed the coins. As the coins were only of one period we may draw the conclusion that at that period the Japanese trade with Kamchatka, through the Aino-Kurilian intermediary, was quite extensive."[9]

Jochelson specifically describes the cultural context of four of the Japanese coins, all of which came from the floor deposits of pit houses. One of these houses was on the bank of the Osernaya River a few miles from Kuril Lake; the others were along the shore of Kuril Lake. The Kuril Lake pit houses contained sadiron lamps of stone, as well as other cultural material somewhat similar to that of the Aleutian Islands. The presence of the Japanese coins suggests that the cultural deposit is not earlier than the eleventh century A.D., and probably not much later. This opinion seems to be shared by Schnell,[10] who says, " . . . they [the coins] most probably belong to same deposit as the Neolithic finds. . . . The time that elapsed between [the coins] being imported and . . . being deposited in the earth may not have been very long."

As mentioned previously, the sadiron lamp is part of the lamp complex believed to have been introduced into southern Kamchatka from the Aleutian Islands. This complex does not seem to be present in northern Kamchatka, which in general has a different culture complex from that of the south. Assuming then, that the dating (eleventh century A.D.) of the deposits in southern Kamchatka is approximately correct and that the sadiron lamp was introduced into southern Kamchatka from the Aleutians, we may conclude that the earliest sadiron lamps of the ancient Aleuts were somewhat earlier than the eleventh century A.D. Thus, these artifacts provide us with a tentative and uncertain means of dating certain archaeological deposits in the Aleutians Islands.

Unpublished data in the collections of the Chicago Natural History Museum show that on Amaknak Island, Aleutian Islands, there were at least two, and perhaps more, periods of Aleut cu[l]ture, an early period and a late period. The sadirion lamp is a part of the culture of the late period, but it seems to be lacking in the early period. Tentatively then, the early period of Aleut culture is earlier than the eleventh century A.D., but how much earlier remains a problem.

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[5] Collins, 1937, p. 376.
[6] de Laguna, 1934, pp. 176–180; 1940.
[7] Collins, 1940, p. 579.
[8] de Laguna, 1940, p. 59.
[9] Jochelson, 1928, p. 37.
[10] Schnell, 1931, p. 63.

BOOK REVIEWS

El Museo de Oro. (Bogotá, Colombia: Banco de la República Colombia, 1944. 17 pp., 2 maps, 50 plates.)

For some time past, the Bank of the Republic of Colombia has been forming a collection of aboriginal gold work which now consists of over 5000 specimens. This volume, with forty-eight plates in color, is a *catalogue raisonée* illustrating the finest pieces. Some of these have been published before, but not in color.[1]

Gold jewelry, with its excessive highlights, is exceedingly difficult to photograph and reproduce, either in black and white or in color. Photography and printing in this case are, on the whole, excellent. The work was done by the Bank's own press, which should be congratulated. Three types of colored background have been used to bring out the surface qualities of the gold. The only possible criticism is that at times there is too much background which might have been filled by additional specimens without crowding the plates.

The short text consists of two introductions, one unsigned and one written by Gregorio Hernández de Alba. Also, Bernadino Sahagún's famous description of *cire perdue* casting of metal is reprinted.

No attempt has been made to set up a detailed classification of styles or metallurgical techniques, but four major geographical groups are recognized. These are the Quimbaya region, to which thirty-three plates are devoted, the Chibchan area, the Atlantic coast (Sinú and Tairona), and the south (Dept. of Nariño). Obviously this is not a basic and definitive study, but, if other volumes are to follow, it will become so.

Opposite each plate is a long caption. This gives the size and weight of the specimens, their provenience, which often is known fairly exactly, and their history since they were dug up. In short, so far as is possible, except for metallurgical analysis, the data which the technical student wants have been provided.

Of the objects illustrated, the majority are for personal adornment: pendants, pins, gorgets, crowns, necklaces, ear disks, nose ornaments, etc. In addition, there are figurines, bottles, a bowl, a spoon, spear throwers, and various overlays which once encased perishable materials.

One of the richest lands in the New World subdued by the Spaniards is the present Republic of Colombia. To be sure, no single treasure was secured comparable to the ransom of Atahualpa. Cieza de León, however, writes that "if the gold in the provinces near the great river of Santa Marta, from the city of Popayan to the town of Mampox, had been in the power of a single lord, as it was in Peru, the wealth would have been greater than that of Cuzco."[2]

Colombian goldwork is spectacular, both on account of the size of the individual pieces and the beauty of the workmanship. Most of the specimens have been cast, at least in part, by the *cire perdue* process, but there are some beautiful big gorgets with designs hammered in relief.

Colombian gold ores, especially in the Quimbayan region, usually contain 15–20 per cent silver as an impurity,[3] which results in a pale yellow metal. The reviewer was therefore surprised to find many objects of red gold, certainly in larger proportion than in any collection in this country. Such pieces must contain a large amount of copper and are classified as tumbaga. Presumably this alloy is very hard, as none of these specimens had been hammered to shape. Nordenskiöld has shown that a cold-hammered Quimbaya chisel containing 33 per cent gold, 12 per cent silver, and 55 per cent copper was fully as hard as the bronze tools used in the Inca realm.[4]

Regarding styles and affiliations, the reviewer has shown[5] that Chibcha, Quimbaya, and Sinú goldwork was traded to the Province of Coclé in Panama and was copied locally. Analysis of metal made it possible to ascertain the place of origin of individual specimens. Beyond Coclé to the northwest, in Veraguas, Chiriquí, and Costa Rica, such trade pieces have not been found. The presence of Colombian objects in Coclé graves, however, is of importance, because it dates certain Colombian styles from the fourteenth and fifteenth centuries A.D.

Looking to the south, certain specimens are very similar to pieces from Ecuador, notably Fig. 27, which represents a human head hammered in high relief on a gold pectoral. Dangling metal disks attached to various objects by wires are characteristic of Colombia and Ecuador but are especially common on the north coast of Peru, where they date from the Late Chimu period. A pair of gold ear spools 9 cm. in diameter also suggest Peruvian influence.

Nose pendants such as are shown in Plates 32, 39, 40, and 41 are so large that they would cover the mouth, cheeks, and chin and have been termed "mouth masks." They are found only in Colombia and in the Nazca region in Peru. The forms, however, are entirely different and do not imply a cultural link.

Only one specimen, illustrated in Fig. 43, suggests an early date. This is a gold plaque with a face beaten in relief. The treatment of the mouth and teeth has a close parallel in the metal work of Ecuador and in finds of Chavín style on the coast of Peru.

This gold collection presumably represents part of the bullion reserve of Colombia. The Bank is to be congratulated on creating a museum to exhibit it and on publishing this volume. It is to be hoped that this is the first of a series and that other countries with archaeological gold in their vaults, such as Peru, will follow the example of Colombia.

S. K. Lothrop

Studies in the Anthropology of Oceania and Asia. Edited by Carleton S. Coon and James McAndrews, IV. (Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, Vol. XX, Cambridge, 1943, 220 pp., 20 plates, 10 maps, 7 text illustrations, $4.50.)

This volume is offered in homage to the memory of Dr. Roland Burrage Dixon by fourteen students whose interests he had directed toward Asia. The variety of subjects discussed and the extent of the area covered is an indication of the world-wide interests of this remarkable man.

A brief introduction cites the main facts of Dixon's life—his education, his field trips, his system of indexing and analyzing anthropological literature, his writings and teaching. It gives an unusually frank and balanced appraisal of his contributions to anthropological science.

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[1] Plates 1, 2, 5, 6, 10, 12, 13, and 14 appeared as crude drawings in *Catálago del Museo del Sr. Leocardio Maria Arango* . . . Medellin, 1905.

[2] Pedro de Cieza de León, *La Crónica del Perú*, cap. CXV.

[3] See S. K. Lothrop, *Coclé, Part I*, Memoirs of the Peabody Museum, Harvard University, Vol. VII (Cambridge, 1937), Table VII.

[4] Erland Nordenskiöld, *Ancient Colombian Tools of Gold Alloy*, Comparative Ethnological Studies, Vol. 9 (Goteborg, 1931), Appendix 3.

[5] Lothrop, *op. cit.*, p. 204.

His interest in physical anthropology is indicated by Shapiro's article on "Physical Differentiation in Polynesia"; by Howell's on "Racial Elements of Melanesia"; by Andrews' on "Evolutionary Trends in Body Build," and by Hulse's on "Physical Types among the Japanese." Comparative Religion is introduced by Oliver's study of southern Bougainville and MacGregor's treatment of "The Gods of Rennell Island." Gordon Bowles deals with "Linguistic and Racial Aspects of the Munda Problems," while archaeology is represented by Emory's treatise on "Polynesian Stone Remains," Handy's paper on "Petroglyphs in the Marquesas," Gaul's observations on the "Bronze Age in Siberia," and Li Chi's discussion of "Prone Burials of Anyang." Sharp deals with "Australian Totemism" and Linton discusses "Cultural Sequence in Madagascar."

With such a range it is inevitable that the papers should be of unequal length and importance and should employ very different methods of approach to the solving of problems. Thus we go from the closely reasoned article of Shapiro, who finds "that the earliest and latest Polynesian immigrants shared a basic physical community," to the more speculative approach of Handy. The latter cites the comment of Krom that the script of the Marquesas resembles old Javanese. On this none too certain basis he then sets up the hypothesis that a single ship loaded with breadfruit shoots met with disaster on the Marquesas coasts and that the shipmaster inscribed a rock there (pp. 29–30).

Gordon MacGregor's concise article was based on two weeks' stay on Rennell Island, while Oliver's investigation in Bougainville covered sixteen months. Howells gives a valuable summary of our present knowledge of racial elements in Melanesia. Andrews, on the other hand, offers us new data on nearly 4000 Siamese subjects. Linton uses present-day traditions of earlier peoples to help solve cultural sequence in Madagascar, while Hulse concludes that historical and ethnological data can help us little in determining the racial background of the Japanese.

Li Chi's rather technical article, which uses certain burials in Anyang to throw light on the middle Bronze Age in China, stands in contrast to the broad perspectives opened up by the monographic study by Gaul on the Bronze Age in the Yenisei Valley. This discussion of relationships of the Yenisei with the Iranian world and with China will appear to many as the most valuable paper in the volume. The bibliography is exceptionally good.

The final article by Coon—"Southern Arabia, A Problem for the Future"—is a masterpiece. It reviews the past and outlines problems for future investigation. It appears that this is the ideal spot to study the relationships and spread of the Negroid, Veddoid, and perhaps Mediterranean peoples. It pictures rich archaeological sites, miraculously preserved, which await the trained excavator. It tells of the fabled pre-Islamic kingdoms once in contact with all the ancient world, and it presents present-day conditions in Yemen where we can see and study "an almost perfectly preserved medieval Mohammedan state." It is to be hoped that this article will come to the attention of a foundation or a possible donor interested in anthropology. The result should be the adequate financing of an expedition to this little known but intriguing tip of Arabia.

The volume will prove of interest and value to all students interested in Oceania and Asia. It is a fitting tribute to a great scholar and teacher.

FAY-COOPER COLE
University of Chicago

The Origins and History of the Mayas. In Three Parts. Part 1. Introductory Investigations. M. WELLS JAKEMAN (Research Publishing Co., Los Angeles, 1945. xxv+203 pp., 10 plates, 12 tables.)

This first volume is largely a discussion of sources and an evaluation of data, but there is a short final chapter in which the main thesis is presented. This is a revival of the old theory, now discarded by several workers in the Maya field, that the Itza were the physical and cultural descendants of the people responsible for the civilization of the Initial Series period in the central area, the so-called "Old Empire."

Mr. Jakeman briefly covers art, architecture, glyphs and ceramics, and fits them all to his scheme of Maya history. This does not vary greatly, save for the introduction of a nebulous period of transition, from that which I myself have used for some years. Unfortunately, Mr. Jakeman has not thoroughly mastered his material. For example, he accepts both the Beyer sequence of style in glyphs and my attribution of such buildings as the Monjas to the close of the Initial Series period. The two ideas are quite incompatible, since, according to the Beyer thesis, the styles of the glyphs show that the Monjas and similar structures date largely from the close of the Mexican period and even from Jakeman's period of decadence. In the neat table Beyer's Type B glyphs are assigned to the Mexican and decadent periods, whereas a few pages later the Dresden Codex, which contains many glyphs of Type B, is placed in Jakeman's transitional period. This transitional period cuts across the middle of the Tepeu phase and includes some of the late stelae of Uaxactun, etc. There are several statements which likewise show a faulty comprehension of subject matter.

Chapter 3 is a brief outline of Maya hieroglyphic writing and the correlation question. It contains nothing new and might well have been omitted. It is valueless to the specialist, too brief for the tyro.

Chapter 4 gives illustrative translations of source materials from stelae to Landa. One page of Codex Madrid is translated in an expansion of Whorf's fantastic system. It seems an unnecessary waste of space to give with the English translation Yucatec, Quiché, and Spanish texts when these are already published. The linguist will go to the sources; the historian will ignore texts in unknown languages. On the other hand, the assembling of the material in the various *relaciones* attributable to Gaspar Antonio Chi is a sound and useful piece of work.

Chapter 6 is devoted to a long discussion of methods of evaluating historical sources with a complicated system of appraisal in the decimal system which should interest those who seek to show with serried ranks of percentages and decimal points that archaeology is a science, not a discipline. This section might have been better handled in a separate publication, to which reference could have been made in this book.

Finally, the last twenty pages contain the kernel of the book, the identification of the Itza with the Maya rulers of the central area. The arguments are presented in a confusing manner, and in some cases are quite misleading. For example, Jakeman credits the book of Chumayel with the statement that the Itza were the builders of the mounds during seventy-five katuns prior to their abandonment of the Chichen Itza, but the source merely states that the "great men" built the mounds, making no mention of Itza or of Chichen Itza. Jakeman's argument that the persons depicted on Itza sculptures of the Mexican period at

Chichen Itza are of the same physical type as those on stelae of the central area is fallacious. Among the hundreds of portraits of both types there are naturally some examples of convergence. However, the deformed skull, Armenoid nose, almond eye, and drooping lower lip, so typical of the true Maya, are seldom or never found in the sculptures of the Mexican period of Chichen, which Jakeman correctly assigns to the Itza.

According to Jakeman, the art of hieroglyphic writing was brought by the Itza to Yucatan. As he accepts the dating of buildings at Chichen Itza which I have proposed, he hasn't a single sure inscription (other than isolated name glyphs of Mexican type) to attribute to the Itza of the Mexican period. One would like an explanation as to why the Itza abandoned glyphic writing and introduced new architecture and a new religion. It is also difficult to understand how the Itza, if they were the same group as the leaders of the central cities, could be termed lewd, sinful, avaricious, idolatrous foreigners and people who speak our language brokenly. Nothing could be more prim than the art of the Initial Series period. The impression that the native Maya viewed with disgust the excesses and lawlessness of the Itza is very strong in the book of Chumayel. The Itza conquest clearly brought a complete change in culture. This is hard to understand if the Itza were the "old gang" who had always ruled throughout the Maya area. The Itza may have been Maya but they certainly did not belong culturally or physically to the group which dominated the central area.

I think the trouble with the historical tables in the books of Chilan Balam is that they have suffered badly at the hand of seventeenth and eighteenth century transcribers who, confronted with events labelled only by the katun in which they occurred, arranged them in a single sequence to the best of their ability, but apparently assigning events which were contemporaneous to positions 260 years apart. Jakeman discusses at length the reliability of pre-Columbian historians among the Maya. The reliability of the later transcribers is more important. They played havoc with the calendar, and I fear they treated history little better.

The English is uniformly bad, as in the case of so many recent Ph.D.'s. It is strange that universities in a country which proudly boasts the Gettysburg address freely award doctorates of Philosophy to students who concoct even for the heading of a table, such assemblages of words as: "A systematic procedural apparatus for historical evaluation or the determination of the approximate historical probabilities of documentarily evidenced facts. Operation 1. Critical evaluation of the evidential elements as to their separate evidential values" (p. 139). Shades of Franklin and Lincoln!

J. ERIC S. THOMPSON
Carnegie Institution of Washington
Cambridge, Massachusetts

NOTES AND NEWS

ARCHAEOLOGICAL WORK ON SITES TO BE DESTROYED BY CONSTRUCTION OF DAMS

Dr. Frank H. H. Roberts, Bureau of American Ethnology, Washington 25, D. C., has been officially designated by the Smithsonian Institution to take charge of projects for the investigation of archaeological remains threatened with destruction by irrigation and flood-control work in various river valleys. The Smithsonian is cooperating with several Federal agencies concerned with the construction and maintenance of such dams. The projects are in the initial stages of development and as yet no detailed information is available. However, anyone needing information of a general nature or knowing of sites that may be inundated should communicate with Dr. Roberts.

The Committee for the Recovery
of Archaeological Remains
FREDERICK JOHNSON, Secretary
R. S. Peabody Foundation
Andover, Mass.

ANNUAL MEETING

The Council has voted to hold the annual meeting of the Society in Indianapolis on May 18. Further details will be released at a later date.

AN ABSTRACTING SERVICE FOR HUMAN BIOLOGY

Biological Abstracts, University of Pennsylvania, Philadelphia 4, Pennsylvania, releases the following:

The Trustees of *Biological Abstracts* announce the establishment, beginning in January, 1946, of a new section of *Biological Abstracts*—Section H, specially assembled Abstracts of Human Biology—intended for anthropologists, sociologists, psychologists, neurologists and psychiatrists, students of child development and human welfare, and students of man generally.

The new section will be an assemblage of all abstracts published in *Biological Abstracts* dealing with the broad field of human and social biology. Biological studies on human inheritance, on population and fertility, on endocrine and neurological factors affecting growth, development and human personality, on alcoholism and drug addiction and on nervous disorders and mental deficiencies, and broad nutritional and epidemiological studies affecting human welfare, are some of the many fields that will be covered. The annual subscription price for the ten abstract issues, plus the complete index of the year's volume of *Biological Abstracts* will be $6.00 ($6.50 outside the United States).

Full information may be obtained by writing to Mr. H. I. Anderson, Business Manager, Biological Abstracts, University of Pennsylvania, Philadelphia 4, Pennsylvania.

EXCAVATION OF FORT STE. MARIE, ONTARIO

Work begun during the summer of 1941 on the site of Fort Ste. Marie I, near Midland, was continued and nearly completed during 1942. The excavation throughout was conducted under the auspices of the Royal Ontario Museum of Archaeology, Toronto, and the Jesuit Fathers of Upper Canada. The technical staff was supplied by the Museum. Three months were spent in the field in 1941, and four in 1942.

Ste. Marie I was established in 1639 as a residence for Jesuit missionaries then working among the Huron Indians. When the Five Nations destroyed the Hurons ten years later, the Fathers burned and abandoned the Resi-

dence. It lay in ruins until the Museum expedition of 1941, except for the work of Fr. Martin in 1853, and a few subsequent amateurs. Now the entire fortified area and some adjacent land has been cleared to the occupation level, or lower. The general layout of the buildings of the compound has been determined, as well as the location of the moats, trenches, and well, making accurate reconstruction possible.

Both European and Indian artifacts were recovered. The large quantity of hardware included a variety of nails, spikes, hinges, locks and such tools as chisels, axes, adzes, a smith's hammer, trowels, a shovel and several unidentifiable implements. Dinner forks, lancets and a silver needle case attest the less austere side of the missioners' lives, with Venetian glass adding a touch of magnificence. Huron material is represented in clay and stone pipes, potsherds in limited quantity, a few chert tools, and a fragment of a fine antler ladle in the shape of a bird in flight.

Historically, the excavation is of prime significance in view of the fact that Ste. Marie was the first white settlement in Ontario and the third in Canada. Archaeologically, it will be of importance in providing a corpus of accurately datable European artifacts, many of which gained currency among the Indians, and in providing a similar starting point for Huron and Algonquin material.

KENNETH E. KIDD

MIDDLE AMERICAN AREA

The following notes on the recent archaeological activities of the Instituto Nacional de Antropología y Historia of Mexico up until the summer of 1945 have been most kindly supplied by Mr. Eduardo Noguera.

"Within the archaeological zone of Teotihuacán the work of consolidation and reconstruction has continued at Tepantitla, where in the last few years some very fine wall frescoes have been found. Further similar frescoes have very recently been discovered at another spot known as Tetitla, also within the Teotihuacán zone. These are of much interest, for they include magnificently drawn representations of Tlaloc and other symbolic motives.

"Also within the Valley of Mexico excavations have been made in the brickyards of Tlatilco, near Los Remedios, where abundant remains of the earliest Archaic cultures are found. The many beautifully made and complete figurines, especially Vaillant's "D" type, and the many complete pottery vessels obtained from this site greatly expand our knowledge of the Early Archaic. Another find of largely similar material has also been made at a site called Xalostoc near Gustavo A Madero (Villa de Guadalupe).

"The exploratory tunneling within the pyramid of Cholula has continued and has allowed examination of buildings belonging to the Teotihuacán Period. Work of installation in the local museum has progressed. Materials taken from the pyramid are exhibited there, as well as a model on a large scale illustrating in an objective manner the form and superposition of all the architectural remains so far found within the pyramid.

"The important site of Tula in the State of Hidalgo has been explored and studied continuously since 1940. The principal results of these studies have been published in various short papers, particularly in *Cuadernos Americanos*, and in a recent summary by Alberto Ruz entitled *Guía Arqueologica de Tula*.

"The work at Xochicalco has included the complete clearing and restoration of the ball court, the clearing of a nearby building containing a number of rooms and patios, and various stratigraphic tests. A report by Noguera on much of this work has appeared in *Cuadernos Americanos*.

"José Garcia Payon, now located in the regional museum at Jalapa, Vera Cruz, has been excavating and repairing the buildings at Zempoala and has been making a model of one of the structures. Explorations have also been made at Xiutetelco, Vera Cruz, and in the building known as Las Columnas at El Tajín.

"At Tzintzuntzan in the State of Michoacán various kinds of studies have been proceeding and have afforded important information on ancient Tarascan Culture. As a complement to these studies, excavations have been made at Chupícuaro, Guanajuato, famous as the place of origin for great quantities of decorated pottery.

"At Monte Alban further work of exploration and restoration has been undertaken on a large scale, the plan being to totally reconstruct the Great Plaza.

"Excavations have been undertaken in the State of Colima at a place called El Charal, twelve kilometers from the Capitol. There is a pyramid of two bodies and with the interesting peculiarity that the stairway is covered with relief carvings concerning Tlaloc.

"Various buildings have been cleared and stratigraphic tests made at several sites in the Huasteca, at El Ebano, San Luis Potosi, and Tamos, Vera Cruz.

"In the Maya area the principal work has been in the repair and reconstruction of monuments. This is being done at Palenque, at Chichen Itza, and in the buildings known as the Nunnery and the House of the Governor at Uxmal."

A letter from Stanley H. Boggs, written on July 23, 1945, includes the following notes on his important work in El Salvador:

"We had another season at Tazumal, from January 10 to June 1, during which we found four more tombs. One of these was very much like those of the 1944 season in containing as furnishings a number of polychrome vessels of the 9.12.5.0.0–9.16.5.0.0 era plus jadeite necklaces, a pyrite mirror, a few pearls, and many shell discs, apparently outsize beads of a necklace. Briefly I think the tombs at Tazumal run as follows: Tombs 1–4 and 7 are roughly equivalent in time to Acropolis Period Copan; Tomb 5, which contained no pottery, cannot yet be dated; Tomb 6 is slightly earlier than 1–4 and 7; and Tomb 8 is earlier yet, tentatively late Esperanza. The aid to dating the buildings at Tazumal which these tomb finds furnish is not very clear, though the later tombs almost certainly are late in the Mound 1 building complex, having been cut through at least four floors. Tomb 8 possibly goes with the Early Platform of Mound 1.

"Because of museum work I have been able to do very little sherd study since 1942, but within a month I plan to settle down to looking through what we have. We will then know more of how the building periods at Tazumal compare with the tomb chronology so far discovered. My guess is that some of the earlier buildings are Esperanza in date, and some of the later are either Copan Acropolis or just previous to that period. In addition, we found this year the remains of two new-type structures which vary greatly from the general Mound 1 norm, as well as from that of Campana-San Andres. These structures differ in plan, construction, and profile from the rest and are stratigraphically later than they are. I suspect that they may have been 'Pipil' (whatever that means) constructions, partially from the fact that quite a lot of Plumbate sherds were found at their base. This is obviously guess-work, but I

think another season would clear up that question. Any sort of ethnic identification is tricky in the Chalchuapa Zone, for historic documents tend to show that the post-Conquest inhabitants there spoke Pokoman, as opposed to clear statements elsewhere that central and western Salvadorans were Pipil. At the same time, the archaeological material, in my opinion, doesn't support the belief that only Mayan peoples lived around Chalchuapa. There is certainly a Mayan ceramic period of Tazumal, but that is the 9.12.5 to 9.16.5 sort of thing. Earlier is some Esperanza material, some of which is more Teotihuacán in appearance than any of the early Mayan known to me, while the latest material includes Plumbate as well as a lot of unidentified pottery which may or may not pertain to Mayan (or Plumbate?) potters. Again, the architecture here isn't that of any Mayan sites known to me—nor to Dr. Kidder. I think the closest resemblance to Tazumal and San Andres architecturally is Kaminaljuyu, and admittedly that resemblance is not immediate. On the basis of Tazumal I hesitantly date San Andres to about 9.10.–9.17. with a few late materials of Aztec times, probably representing re-occupation. On the other hand, Tazumal must have started in Esperanza times and been inhabited more or less continually until almost, if not, the Conquest.

So far as field work goes, Tazumal is about the toughest place I've ever tackled. It is not too well preserved, and the reconstructions made throughout its history are terrifically complicated."

Under the auspices of the Carnegie Institution of Washington, Dr. Hellmut de Terra will spend the winter months of 1945–46 in Mexico studying the Pleistocene geology of the Valley of Mexico and vicinity. These studies should be of great value as a background to eventual finds of early man.

Isabel Kelly sends the following summary of her archaeological work in Western Mexico:

"Unfortunately, my activities in West Mexico have been suspended for want of support; this applies not only to field investigations, but also to preparation of manuscript. Since the present impasse may continue indefinitely, perhaps it is advisable to summarize the work to date.

"*Surface survey.* Surface collections have been made over an extensive zone in West Mexico. For the most part, they are sufficiently full to permit delineation of culture areas and to distinguish local ceramic horizons, although in some cases the latter cannot be given tentative temporal significance until the surface collections are supplemented by excavated material. The following areas have been covered by survey.

a. *Coastal Nayarit* (valleys of Acaponeta, San Pedro, and Santiago; and the coastal strip, from Ixtapa to the Jalisco border).
b. *Coastal Jalisco* (from Puerto Vallarta to Sihuatlán).
c. *Jaliscan plateau:* Large surface collections have been made in the Autlán-Tuxcacuesco and the Sayula-Zacoalco-Villa Corona zones.
In addition, small surface collections, which should be supplemented by further data, come from: the upper Purificación drainage, from the western half of the old Provincia de Amula (Cuzalapa, Ayotitlán, etc.), from the area formerly known as the Pueblos de Martín Monje (Tenamaxtlán, Tecolotlán, Atengo, Ayutla, etc.); from the Etzatlán-Ahualulco zone, from the Zapotlán-Tuxpan-Tamazula areas, and from the Guadalajara-Tonalá zone.
d. *The Jalisco-Zacatecas border* (the old Caxcana), including Teocaltiche, Nochistlán, Juchipila, Teúl-Tlaltenango, and the upper Bolaños drainage (Mezquitic-Nostic).
e. *Colima.* Collections from most parts of the state, with more information needed from the zones about the Volcán and along the Michoacán border.
f. *Michoacán.* Chiefly excavation; see below.

"*Excavations.* Excavations have been made at key sites, as follows:

a. *Sinaloa:* at Culiacán and Chametla, in the central and and southern parts of the state respectively.
b. *Jalisco:* excavations near Tuxcacuesco and at sites immediately downstream, along the Rio Armería.
c. *Colima:* excavations near Los Ortices and at Chanchopa, the latter near Tecomán.
d. *Michoacán:* excavations and survey in the Tepalcatepec Basin, in the Apatzingán area.

"*Publications.* From these excavations and survey, the following publications have resulted to date:

a. Excavations at Chametla, Sinaloa. UC-IA, 14, 1938.
b. The Relationship between Tula and Sinaloa. Revista Mexicana de Estudios Antropológicos, 5: 199–207, 1941.
c. West Mexico and the Hohokam. "El Norte de México e el Sur de Estados Unidos," Sociedad Mexicana de Antropología, 206–222, (1944).
d. The Archaeology of the Autlán-Tuxcacuesco Area of Jalisco. Part I, UC-IA, 26, 1945.
e. Excavations at Culiacán, Sinaloa. US-IA, 25, 1945.

"As by-products of the archaeological survey, the following notes have been issued:

f. (with Edgar Anderson) Sweet Corn in Jalisco. Annals of the Missouri Botanical Garden, 30: 405–412, 1943.
g. Notes on a West Coast Survival of the Ancient Mexican Ballgame. Notes on Middle American Archaeology and Ethnology, Carnegie Institution of Washington, 26, 1943.
h. Txtle Weaving at Chiquilistlán, Jalisco. Same series, 42, 1944.
i. Worked Gourds from Jalisco. Same series, 43, 1944.

"Reports in press include:

j. An Archaeological Survey of the West Coast of Mexico. Twenty-seventh Congress of Americanists, Vol. 2.
k. The Archaeology of the Autlán-Tuxcacuesco Area of Jalisco. Part II, US-IA.
l. Excavations at Apatzingán, Michoacán. Viking Fund.

"All excavated material has been prepared for publication, save the important tomb collections from Colima. A report on the surface survey in the Sayula-Zacoalco-Villa Corona zone is near completion. However, between eight and ten tons of archaeological material are in storage, awaiting study and preparation of reports."

ERRATUM

Through an editorial error Figure 8, page 71 of the October number was titled "Plan of Tomb A-IV." It should read "Plan of Tomb B-II."

MEMOIRS

of the

SOCIETY FOR AMERICAN ARCHAEOLOGY

The following numbers, may be obtained from the Treasurer, Frederick Johnson:

Number 1. *Big Bead Mesa: An Archaeological Study of Navaho Acculturation, 1745–1812.* By DOROTHY LOUISE KEUR. 90 pages, 4 plates, 5 figures. $1.00.

Number 2. *The Tchefuncte Culture, An Early Occupation of the Lower Mississippi Valley.* By JAMES A. FORD and GEORGE I. QUIMBY, JR., with an appendix on the Skeletal Remains by CHARLES E. SNOW. 113 pages, 12 plates, 23 figures, 3 folding tables. $1.50.

INFORMATION FOR AUTHORS

AMERICAN ANTIQUITY publishes original papers in the field of American Archaeology and in subjects related thereto, as well as comments, reviews, or discussions on matters pertaining to these fields. Fields include archaeology, ethnology, geography, and such other sciences as have bearing on man's existence or activities in the New World.

Accepted papers are published in the order of their receipt. Except for such papers as may be specially solicited, all papers bear the date of submission.

Manuscripts must be typewritten in standard 8½×11 paper, double spaced, and on one side of the page only. Bibliographies must follow a standard form. Citations from journals should be given as follows:

JENKS, ALBERT E. and LLOYD A. WILFORD
1938 "The Sauk Valley Skeleton." *Bulletin of the Texas Archaeological and Paleontological Society*, Vol. 10.

citations from separate books:

JENKS, ALBERT E.
1936 *Pleistocene Man in Minnesota.* University of Minnesota Press.

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